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ADVENTURES IN GAMES DEVELOPMENT: NEWS, VIEWS & MORE

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Creative Assembly at total war with immigration cap

Studio boss Tim Heaton has words with culture minister Ed Vaizey as Sega unveils ambitious new Alien project

by Rob Crossley

UK culture minister Ed Vaizey at The Creative Assembly's West Sussex base

THE CREATIVE Assembly is calling on the government to rethink tough immigration rules, as the UK studio begins a global talent hunt for its next major triple-A project.

The award-winning *Total War* studio has expanded with a new 10,000 square-foot floor at its West Sussex base, and wants to bolster its staff count from 160 to around 200 people. At the centre of that expansion plan is a new project for the Sega-owned studio; a major multiplatform game based on the *Alien* licence.

And to succeed with the highly ambitious project, studio director Tim Heaton says the best talent from around the world is being sought – at least, as many non-UK staff as the law can allow.

"It was clear that our console team wanted to do something in the core games space, and we thought about lots of different things, and we pitched a playable demo of *Alien* to Sega, and they loved it," Heaton told *Develop*.

"So we've had a core of a team who have created technology for the project, and have built a really experienced group of people from all around the world."

The Creative Assembly held a press conference last month to unveil the new *Alien* project – an event given a touch more gravitas with an opening speech from UK culture minister Ed Vaizey, who was keen on talking up the continued development success of the studio's home country.

> ***"We've gone out aggressively to find new people from all around the world, and immigration was one of the things I have spoken to Ed Vaizey about."***
>
> Tim Heaton, The Creative Assembly

Heaton, however, said that he had a private moment with the minister to discuss one government policy that might serve to hinder Britain's current fortunes in the video games space.

"We've gone out aggressively to find new people from all around the world", Heaton explained. "And immigration was one of the things I have spoken to Ed Vaizey about, because I don't want any cap on bringing in staff."

Prime Minister David Cameron recently said it was his government's ambition to reduce immigration to 1980 levels, where there would be "tens of thousands rather than hundreds of thousands" of non-EU workers coming in.

The UK's proposed cap on non-EU workers is about 1,500 per month. Those earning over £150,000 won't be vetted, and there will be leniency for certain sectors such as those related to the sciences.

Many British studios, and trade body Tiga, have slammed the immigration policy.

"The Government needs to ensure that its immigration policy does not hinder Britain's economic growth by restricting the migration of skilled workers," Tiga CEO Richard Wilson said.

Turn to page 50 to read Heaton's article on studio management.

creative-assembly.co.uk

Editorial

Apple's pips

APPLE GETS a fair amount of criticism from developers, pundits and consumers for its behaviour both inside and outside the games industry.

When you're one of the most popular companies on the planet there's bound to be an attack or two.

Unfortunately, some of them hold water. It's master of the draconian silences, it rarely admits fault, and isn't always perfect. With a culture of secrecy that extends from product development right through to some vagaries around its app approval service, Apple wants its own way most of the time. In many respects, that makes it just like any other corporate giant.

But here's the real reason why I think their indiscretions or draconian ways can be, if not forgiven, at least tolerated – the amount of good its platforms have done for games developers is almost unmeasurable. It just about outweighs all the bad stuff.

I say almost. The publication of the *Develop 100* this month proves that Apple provided a revolutionary way for all kinds of developers to improve their businesses or start new ones. Half the studios in the listing are iOS developers, this year included courtesy of our switch to using Metacritic to draw a more clearer answer to the question 'Who makes the best games in the world?'

Were you expecting that some of the answers to that question would be 2D Boy (US), Media Vision (Japan), or Straandlooper (UK)? No, and they probably weren't either.

Apple's success is of course just the tip of a digital distribution iceberg built by the likes of Valve and Xbox Live Arcade, but it is emblematic of the shifts underway.

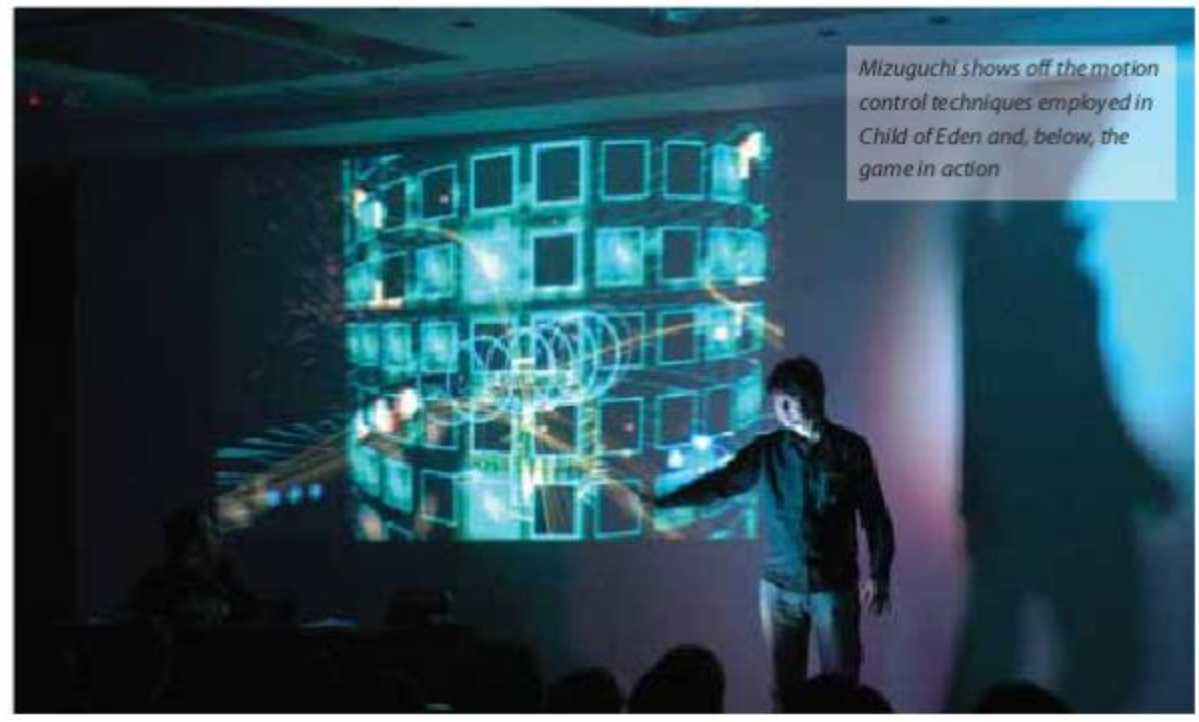
Fewer developers want to be hidden away in monolithic teams. Supersized studios were once the norm, but are now the exception. Small studios, or ones with more fluid workforces, are more common. Cover star Mind Candy, for instance, has just over 50 permanent staff for its online service, supported by a similar number of staff crucially on alternative contracts.

Are we due another shift back to large teams? If the next console generation comes sooner than expected then maybe, but for now being a solo indie or teaming up with your friends to release game has never been more viable.

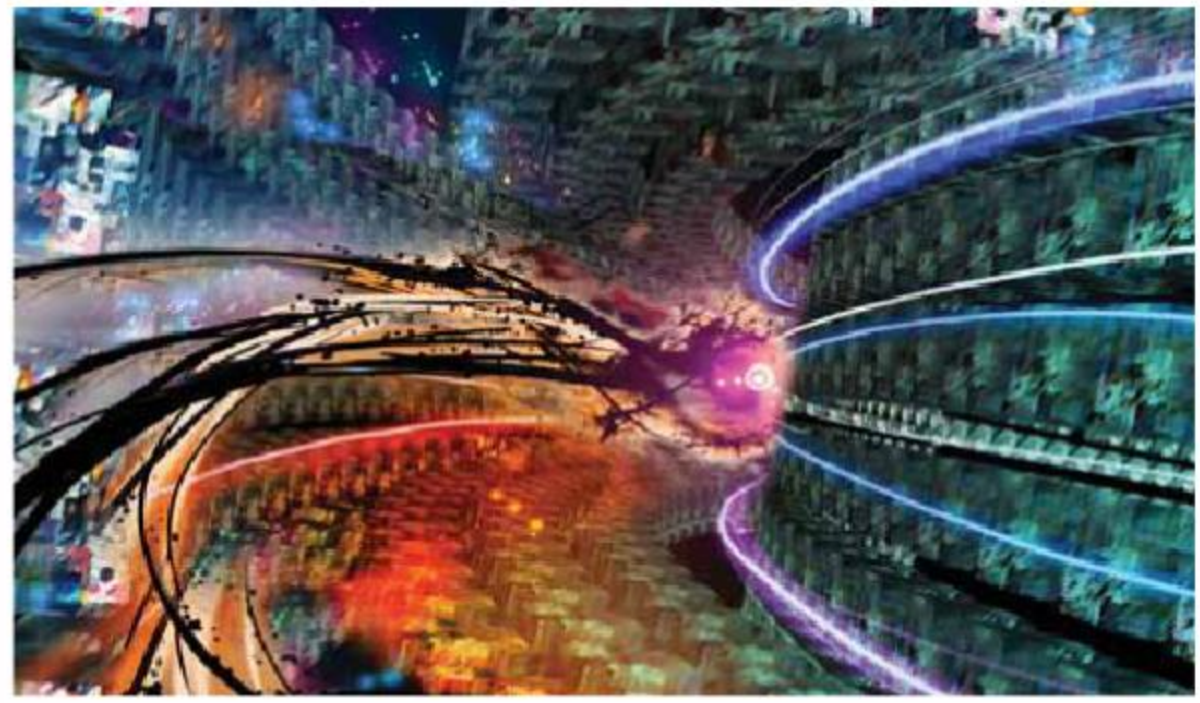
Michael French
michael.french@intentmedia.co.uk

Mizuguchi: 'Today's

The world's most provocatively creative developer on why new



Mizuguchi shows off the motion control techniques employed in Child of Eden and, below, the game in action



by Will Freeman

FAMED GAME design luminary Tetsuya Mizuguchi has told *Develop* that *Child of Eden* marks the point where technology has caught up with his creative energy.

Speaking as the June 17th release of the synaesthesia game neared, Mizuguchi claimed that the likes of new surround sound systems and HD and 3D displays mean he and his contemporaries can finally develop products that meet his vision of games as 'emotionally meaningful works'.

"My games as they are today, and the possibilities within games that I try to explore, are about making the player feel emotions," said Mizuguchi.

"What I mean is making the player experience rich, organic feelings. Before *Child of Eden* we tried, and we had the chemistry, but the not the technology. Now, with new technology like high definition, 5.1 and 7.1 surround sound, and even 3D, there are many opportunities for this kind of game to realise its full potential."

The man behind *Sega Rally*, *Rez* and *Lumines* went on to speak specifically about his interest in 3D display; something that has not been confirmed as a technology supported by *Child of Eden*.

"I think there is much we can do with the new 3D technology," said Mizuguchi, as he explained why he believes his distinct flavour of music game still has plenty of potential to carry new ideas and concepts.

"That kind of 3D gives game designers and those making synaesthesia games a much wider canvas. 3D provides us with many, many new creative ways and approaches."

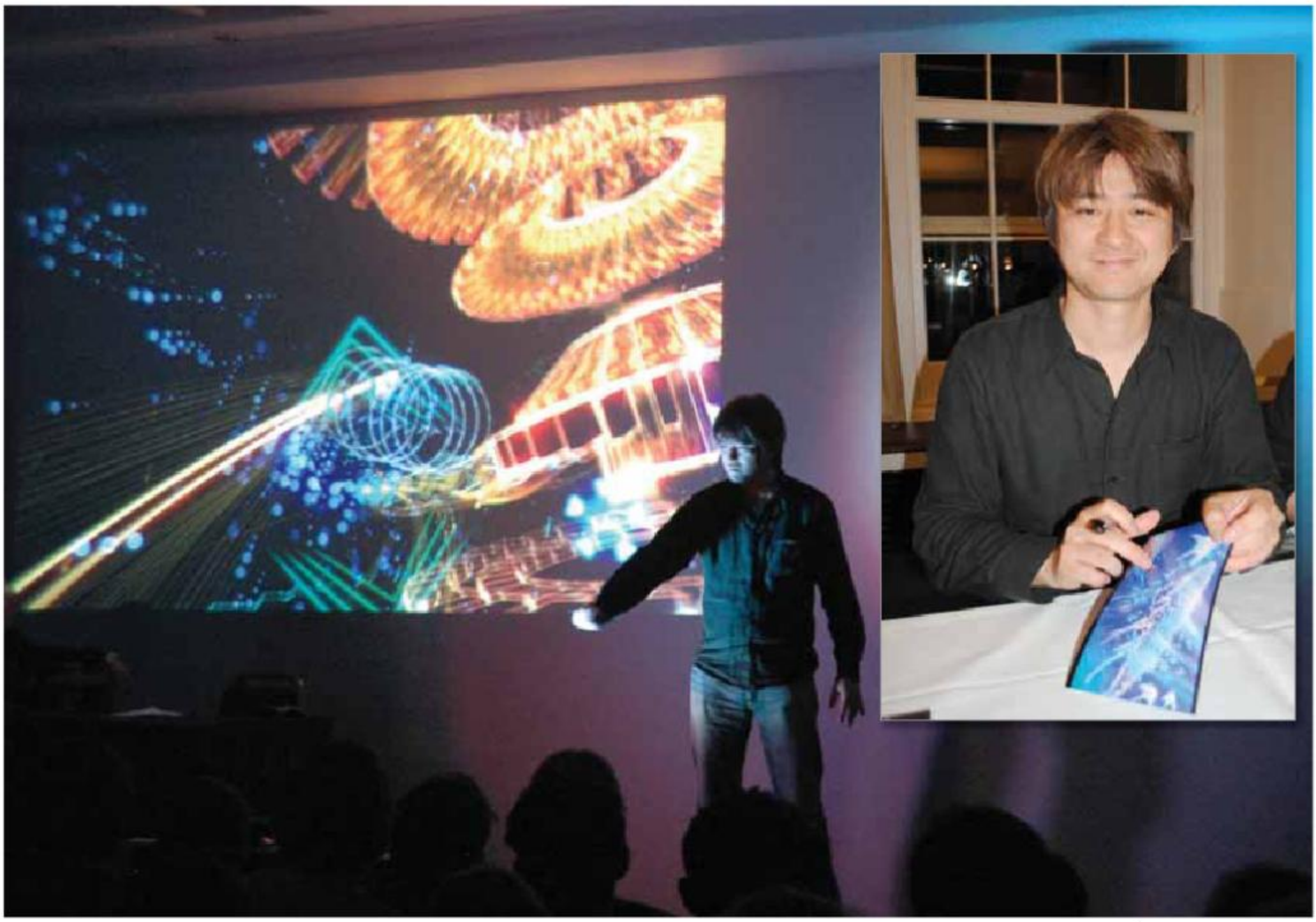
Yet despite repeatedly stating his enthusiasm for new techniques and methods, Mizuguchi insisted he was 'not a technology man', claiming that he sees the newest display and audio hardware as exactly the same kind of technology as paintbrushes.

"The more paintbrushes we have, the more we can do," he insisted. "It is simple."

Mizuguchi also revealed that his long career at Sega was almost not to be, saying that in his initial interview at the company he mistakenly claimed the firm had made the Famicom. He went on to offer *Develop* a fascinating insight into his perspective on the creative process of designing games.

technology is ready for my ideas'

hardware is finally ready for his latest and greatest creation, synaesthesia masterpiece Child of Eden



"The games I've made are a designing – or rather a redesigning – of human desires and human wants, and basic emotional instincts," he stated.

"In games, a feeling of accomplishment with those elements is important."

He went on to forward his belief that the abstract settings that often define his games serve as a 'common code' for the players; a place where every kind of consumer can explore his ideas.

"I don't know why it is, but I do believe in the people's ability to be able think for themselves. Everybody can feel and think and imagine. I believe in the player's imagination, and that the player can be creative, and that is why my games are the way they are," concluded Mizuguchi.

"Making a game is like writing a poem. Keeping things small, using very few words, you can still make the reader feel, and you do not need to make everything obvious."

Mizuguchi also confirmed that he feels very high stress in the creative process, but said that his respect for the games team at Q Entertainment – who are apparently all devoted to synaesthesia – is absolute.

> ***"Making a game is like writing a poem. Keeping things small, you can still make the reader feel, you don't need things to be obvious."***
>
> Tetsuya Mizuguchi

Additionally, he offered his perspective on the ultimate goal of game makers, arguing that synaesthesia serves as a vehicle for progressing the medium.

"It's kind of like a dream for game designers and for game creators and makers to make something new, and something that becomes the new frontier of the imagination," said Mizuguchi.

"If we didn't have an area like the imagination from which we make games, there would be nothing new at all, and we'd still all be playing 8-bit games. Following the synaesthesia direction gives us many new reasons and chances to push at the boundaries of the imagination. There are many new opportunities."

Mizuguchi concluded by talking about Kinect, and it's potential to host new forms of gaming experience that cross borders with performance art.

"I'm interested to see if anybody will create anything that allows for some kind of performance through Kinect; Something that combines the act of DJing and VJing. It's possible in the future that we will see something like that."

www.qentertainment.com

Above: Tetsuya Mizuguchi is keen to alter the way people think about video games design

FACE TO FACEBOOK

Specialist game agency Adotomi has launched a new Facebook API for game developers looking to widen the reach of their creations. **Will Freeman** caught up with the company's CEO Joe McCormack to find out more

The IronFlyer Facebook API promoting games on the social network (top) and Adotomi CEO Joe McCormack (above)

What exactly is IronFlyer?
IronFlyer is a Facebook API for games. It allows our users to tap into the rich player demographics that exist within Facebook, in a targeted and intelligent way. We are excited by this new service and really feel that the meticulous development process we went through is going to generate huge value for our clients' games.

What does the tool allow game developers to do?
The IronFlyer service actually empowers game developers to reach audiences that will make the difference to their games. Through deep analytical targeting, this service allows us to match specific player profiles with our client's games. This is something that has never been achievable before in a scalable environment. Additionally, we are game-centric – all our staff are gamers – this allows us to build engaging ad copy and creatives that really speak with end users.

What differentiates IronFlyer from other marketing tools of this kind?
It is a specialist service for the gaming industry. We combine smart technology with engaging ad copy that targets actual gamers. One of the key differentiators is our Intelligent Cluster Group technology. Through this proprietary tool we have mapped out gamers and their habits across Facebook. This allows us to target more paying users.

For our readers who don't know Adotomi, who are you?
Adotomi has been serving the gaming industry since 2007. During this period we have leveraged our unique market position to develop gaming specific services, allowing us to execute powerful marketing strategies for our clients.

IronFlyer has just been released. What about the current climate makes a tool like this so important?
As the gaming space matures, our clients are constantly looking for smarter ways to find the right players for their games. There is a wealth of demographic information that exists across Facebook. We understand that the ability to uncover, aggregate and target user demographics is of paramount importance for our clients.

> ***"Two of the most important factors in the success of a Facebook game involve the uniqueness of the game and having an acute community focus."***
>
> Joe McCormack, Adotomi

For game developers looking to move into the Facebook space, what areas and kinds of gaming experience on the social network does Adotomi see as those with the most potential for success, or those that are the most overcrowded?
Probably two of the most important factors in the success of a Facebook game involve the uniqueness of the game type and having an acute community focus. Niche games that have a well built model for community support, stimulation and engagement of the user base enjoy a lot of success in the current Facebook environment.

What challenges currently face the ever-expanding Facebook games market?
In order to create a much more user centric environment within Facebook, they have quite rightly reduced a lot of the viral channels that used to exist within the platform for game developers. Things such as automatic posts on walls are no longer possible. It used to be that for each user you brought to your game, you could expect at least another ten or 12 players to join virally. This no longer happens. The big challenge for game developers is how to compensate for this lack of virality in their marketing plan through paid media channels and still generate positive return on investment.

I understand IronFlyer is algorithmically based. How does that approach benefit the tool's users?
Our algorithm allows us to bring really targeted players to our client's games. Through this targeting linked with our realtime bidding algorithm, we are able to bring the best players to games.

What other services does Adotomi offer?
Adotomi is a full service agency for the gaming industry. We provide our clients with managed media solutions, third-party affiliate management for recruiting new players, a full PR service for new title launches across all formats and creative and design services. We are a very practical agency focusing on getting games the proper exposure to the gaming market.
www.adotomi.com

Which is the most ported extreme sports game?

BMX Simulator

Tony Hawk's Pro Skater 2

California Games

ANATOMY OF A BLOCKBUSTER

Our monthly dissection of a recent hit game...

Portal 2

PUBLISHER: Valve
DEVELOPER: Valve
FORMAT: PC/Mac, PS3, Xbox 360
PRICE: £34.99 – £49.99
www.thinkwithportals.com

Portal 2 may have singlehandedly pulled the FPS genre out of its recent rut

THE SENSATION

When *Portal* was released as part of *The Orange Box*, 2007's uber-generous multipack of games on one disk, Valve weren't expecting too much of it. Squeezed in beside the latter parts of the monolithic *Half-Life* saga and the online multiplayer phenomenon *Team Fortress 2*, it was simply filling out the numbers. With a play time of around four-to-five hours, it was as much tech demo as full, standalone title. When it became one of the most talked about games of the decade, its developer seemed just as surprised as everyone else. *Portal* shocked. Simple gameplay with almost limitless applications and an expertly realised black comedy tale of science gone mad fused. A small but perfectly formed game reset the bar very high indeed.

THE GAME

It was good news then, for Valve, series and studio fans, and for those being introduced to the franchise with *Portal 2*, that the sequel met – and some may argue exceeded – expectations. Taking the physics-defying gameplay mechanic of *Portal* – in which a sequence of puzzle rooms are traversed by way of a gun which fires doorways in walls, ceilings and floors – and applying it with assurance to a far larger canvas, *Portal 2* developed the series narrative and gameplay significantly. The introduction of 'gels', brightly coloured pastes that can be applied to surfaces to make them by turns bouncy, slick or able to hold portal doorways, aided that development and opened up new possibilities for brain-twisting humour that has become a hallmark of the *Portal* name. Along with the co-op campagin mode, Portal 2 represented a confident and convincing attempt at the difficult second installment.

THE STUDIO

Valve is the studio of the quixotic, the unapologetic romantics embracing the Valve Time disconnect between when games are promised and when they actually appear. They do so because they know that, so far at least, the quality of every single thing the company has touched makes it worth the wait. *Half Life. Team Fortress. Left 4 Dead. Counter-Strike. Portal*. These games and their sequels, spin-offs and updates have cemented themselves within the popular psyche, and on all counts with good reason. The games are released when they are ready. And, if all that wasn't enough, there is one final word that perfectly encapsulates the addictive ingenuity of Valve: Steam.

UNIQUE SELLING POINT

A gun that shoots portals on walls. The vitriol of GLaDOS. The Moon. The idiocy of Wheatley. Co-op testing chambers. The most well controlled and entertaining utter madness this side of the cuckoo's nest. The draw of the *Portal* series is, on a surface level, the draw of pitting your wits against those of the game's designers. Thanks to the skill of those designers and the game's writing team, that desire is soon turned against a megalomaniacal AI. Before any noticable time has passed, that desire is compeating against an unadulteraded love for the various characters trying to kill you. Also, for a box with a heart on it. Love and portals.

WHY IT WORKS

The FPS genre has fallen into a rut or two over its lifespan. There is an undeniable thrill in seeing enemies tumble away before the hot lead death flowing from a boom-stick at your fingertips. No thrill can maintain endless momentum, however. In the '90s there were endless clones of *Wolfenstein* and *Doom*. Then came *Halo*. Then came endless clones of *Halo*. Then came *Call of Duty*, and so the cycle continued. Within that eternal return, however, Valve games have managed to avoid the threat of turing stale where many others have not. *Portal 2* works because there is goo you can run really fast on. Because Cave Johnson is a hilarious counterpoint to GLaDOS. Because Cake is hardly even mentioned. It is *Portal* evolved, not repeated.

TRY IT YOURSELF

Throw out the shedule. Crack your knuckles. Think hard. What the world doesn't need is another military-themed FPS set in the Middle East. Anyone can tell you that. What does it need? What's fun? Jumping really high is fun. What's scary? Spiders are scary. Zebra spiders jump pretty high, relatively speaking. So what would a game about fighting massive zebra spiders in a pair of special super-jumping boots be like? Probably rubbish. Still, it's a place to start, and it represents a semi-serious attempt to bust out of the cookie-cutter design mentality. Take a page out of Valve's book. Be brave. Be stupid. Be romantic. It probably won't work, but what if it does?

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//COMMENT: BUSINESS

The Facebook hardcore

by **Nick Gibson**, Games Investor Consulting

Kabam's games – such as Dragons of Atlantis (above) – have proved there is a viable hardcore market on Facebook

THIS MONTH, I'm returning to our series of profiles of games companies achieving great commercial success with innovative and rule-breaking business strategies.

This time US social network games company Kabam comes under the spotlight, a studio that has grown phenomenally fast targeting what many have considered a non-existent and non-viable audience: hardcore Facebook gamers.

A few months back we analysed opportunities in hardcore social network games development, arguing this was a sizeable but under-served market. Kabam recognised this potential as early as 2009, taking a significantly risky but highly prescient gamble to move away from nurturing mass-market sports communities online and into niche browser-based strategy games.

ON THE MONEY

A superficial glance at their changing user base would suggest it was a disaster. Before the 2009 launch of its first strategy title, *Kingdoms of Camelot*, Kabam – then called Watercooler – had 25 employees and its sports communities peaked at 26 million monthly active users. 15 months later and with the sports communities now largely gone, it has a quarter of the number of monthly users (7.2m MAU). Such a decline would be the kiss of death for many social games companies but Kabam now has 16 times the number of employees (over 400 and still growing).

What makes Kabam special is that this remarkable headcount growth has been underpinned by equally strong revenue growth, with the company remaining profitable throughout this hiring spree. Like most top social network games companies, Kabam wisely took advantage of the VC interest in all things social to raise around

> ***"Kabam has grown phenomenally fast targeting what many have considered a non-existent and non-viable audience: hardcore Facebook gamers."***

$40m in three rounds, giving it a war chest to acquire and invest in new teams and games. These funding rounds graphically demonstrate the benefits of its strategic volte-face. Its valuation rose from $20m in October 2009 to reportedly a few hundred million dollars just 13 months later.

So how has Kabam achieved such a meteoric rise? Put simply, it has deliberately gone after an unfashionable audience largely ignored by other social network games companies, creating video games specifically for them, and nurturing a community around them.

Where the average age of social network gamers overall is early-mid 40s, and a comfortable majority are female, 70 per cent of Kabam's user base are male and aged 18-to-35. This demographic plays more (Kabam's average session lengths are a multiple of Zynga's) and, most importantly of all, pays more (Kabam boasts that its monetisation is market leading).

Kabam has borrowed the best of multiple worlds: the heavily localised browser-based gameplay appeal of off-Facebook games like *Travian*; the viral propagation features of Facebook games like *FarmVille*; the commercial benefits of the aggressive freemium microtransaction business models used by companies such as Aeria Games.

WHEN IN ROME

The result is a portfolio of games offering deep, collaborative and competitive gameplay based on common hardcore strategy themes – fantasy or ancient Rome for example – whose communities are richly cultivated through regular content updates and special events.

The games generate revenue through microtransactions which are used to buy largely gameplay-enhancing and frustration-reducing items and services.

Premium cosmetic items are comparatively limited and Kabam makes use of lucky dip sinks – such as randomised item purchases – an increasingly common, if blatantly commercial, technique used by games companies to inject gambling elements into their game.

Unlike most Facebook games developers, Kabam caters extensively to international users and most of its recent new users have come from outside the USA.

Interestingly, despite the success of its formula, Kabam sees its future increasingly lying outside of Facebook: on other social networks, mobile devices, its standalone portal and eventually console. Kabam's new IP plans therefore now revolve around developing multiple SKUs and the resulting business model (and audience) diversification will clearly present it with a new set of risks to overcome.

Kabam's success to date teaches us multiple lessons although two stand out for me. Firstly, developers should not be afraid to take a dramatic new strategic direction if the new direction has sound commercial footing. Secondly, a contrarian point of view is not necessarily an incorrect point of view; if you think there is an untapped market out there, why not go for it and prove everyone wrong? Kabam certainly did.

Nick Gibson is a director at Games Investor Consulting, which provides strategy and research consulting services for games, media and finance companies, plus commercial check-ups and online game optimisation for studios. **www.gamesinvestor.com**

//COMMENT: OPINION

The generation game

by **David Braben**, Frontier Developments

Are the eagerly anticipated major console launches so beloved by retailers and consumers a thing of the past?

SINCE ABOUT 1982 there has been a generational update of multi-purpose games machines, starting with 8-bit machines like the BBC Micro, Commodore 64 and NES, approximately every six years, each with roughly equivalent hardware performance to others in the same generation. With each cycle not every machine was spot on this 'tick' but they were close – a year or so either side – something like this:

1. (1982) 8-bit: Apple II, BBC, Spectrum, NES, C64, Atari 800, Amstrad CPC etcetera
2. (1988) 16-bit: Atari ST, Amiga, Megadrive, SNES, PC
3. (1994) 32-bit: PS1, Saturn, N64, PC
4. (2000) PS2, Xbox, Gamecube, PSP, PC
5. (2006) Xbox 360, PS3, Wii, PC

From the late '80s onwards the PC joined the fray, but with a more continuous rate of updates – with the consoles typically slightly ahead of even the top PCs in performance at the start of the cycle, and significantly behind by the end.

Yet the convenience and compatibility of consoles and their much lower cost outweighed any performance benefits of the expensive and fragmented PC market for all but a small minority who felt that the expense of being on the 'bleeding edge' was absolutely justified.

Between now and around Easter 2012 we expect the release of a slew of tablet machines using new mobile hardware based around dual or quad core ARM Coretex A9 CPUs and up to four graphics cores, which brings their performance very close to that of the PlayStation 3 and Xbox 360.

This is significant, as the mobile arena is getting updated continuously; much more like the PC of old.

The iPad 2 has already passed the performance of PlayStation 2 and Xbox, and is comparable to Wii – and given the timing between the release of the iPad and iPad 2, there will be no surprises if an iPad 3 comes out in a year's time.

> ***"Perhaps the six-year tick will change, and blur into a continuum of improvement, but that is more likely to be a good thing for the industry."***

The big issue, with the iOS machines especially, is that they are much closer to the hardware monoculture of the console, with similar convenience and compatibility. They really are small portable consoles, but with an annual update rate.

EASY WINNINGS

Some have speculated that this will destroy the console as the update rate of mobile platforms is prodigiously high, but there is a huge assumption behind this.

The reason that the update rate has been so high is that they are playing catch-up with the current forefront of technology, and by this time next year, the 'easy wins' of taking technology proven in either PCs or console environments will have been near enough exhausted.

For the last couple of generations at least, consoles have driven the forefront of technology at great expense to Sony and Microsoft, and the tools and technology developed as a result have benefitted our industry as a whole.

The fierce rate of mobile development may continue, but someone will have to fund that development, and it is less likely to happen at such a fierce rate as a result.

As this forefront is approached, power will become a major issue; the battery technology is a big barrier. Look what percentage of the volume of an iPad is battery already. This may be why Apple is rumoured to be announcing a games console of its own.

The requirement for power alone will keep the console ahead in performance at least. Perhaps this will be less important with focus on interfaces – touch screens, motion control, augmented reality – but personally I cannot see the console disappearing any time soon. Perhaps the six-year tick will change, and blur into a continuum of improvement, but that is more likely to be a good thing for the industry. Change is something we have dealt with for the last 30 years in this business, and I don't see that changing.

David Braben is the founder of Cambridge-based Frontier Developments. Best known as the co-creator of *Elite*, Braben has contributed to, designed or overseen a number of other projects including *Frontier: Elite II*, *Dog's Life*, *Thrillville* and *LostWinds*. Frontier is currently developing his next title, *The Outsider*. He is also closely involved with Skillset.
www.frontier.co.uk

//COMMENT: LAW

Copy Protection Technology

by **Tatiana Kruse**, Salans LLP

Nintendo felt it necersary to sue Console PC Com for infringements relating to anti-copying or anti-modification devices or services

SECTION 296 of the Copyright, Designs and Patents Act 1988 confers on software publishers, owners and exclusive licensees of the copyright in software to which anti-infringement devices have been applied. It also confers on owners and licensees of intellectual property rights in the anti-infringement devices, the rights to protect their programs or devices against certain acts of circumvention.

Those persons' rights are infringed by persons who, knowing that such means are likely to be used for infringement, manufacture for sale or hire, import, distribute, sell, hire, or have in their possession for commercial purposes, any means the sole purpose of which is to facilitate the unauthorised removal or circumvention of the technical device.

It is also an infringement to publish information intended to enable or assist others to remove or circumvent the technical device. So, it is unlawful commercially to exploit devices that are designed to circumvent anti-copying or anti-modification devices in computer games or to publish anti-copying or anti-modification guidance.

THE LETTER OF THE LAW

Section 296ZD (nice section number and implementing the Information Society Directive) of the Act confers similar rights with regard to works other than computer programs, and against the circumvention of anti-infringement effective technological measures. Technological measures are 'any technology, device or component which is designed, in the normal course of its operation, to protect a copyright work'.

> ***"It is unlawful commercially to exploit devices or services whose real purpose is to circumvent anti-copying or anti-modification functions."***

What is prohibited is the manufacture, importation, distribution, sale, hire, offer, advertisement, or possession for commercial purposes of any device, or the provision of services marketed for the purposes of circumvention of the technological measures, or which have no other significant purposes than circumvention, or are primarily designed for circumvention or to facilitate it.

So, it is unlawful commercially to exploit devices or services whose real purpose is to circumvent anti-copying or anti-modification functions in music and video-recordings.

Nintendo recently sued Console PC Com Ltd for those infringements. Nintendo had implemented measures against loading and playing unlawful copies of games on its games consoles. Those measures were a file that encoded Nintendo's logo, encryption and scrambling.

A SENSE OF SECURITY

Console PC imported and dealt in game copiers, which contained circuitry and software (including a copy of Nintendo's security file) enabling them to pass Nintendo's verification tests. Nintendo said Console PC had dealt in devices designed to circumvent Nintendo's copy protection technology used to protect its games consoles and the games designed to be played on the consoles.

On the facts, Nintendo obtained summary judgment. Note that, with regard to what is required for 'effectiveness' under section 296ZD, the Court found that Nintendo had implemented effective measures because they controlled access through encryption and scrambling.

And, just to add to the warning, Console PC's director was found jointly liable.

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tkruse@salans.com

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*Sources: Arab Media Outlook 2010. Media on the Move 2009. A.T. Kearney. Introduction to Gaming. Michael Moore. Screen Digest. IDC.

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THE DEVELOP CONFERENCE 2011

A round up of some of the most exciting sessions at this year's Brighton event

The international games development industry are gathering again in Brighton in 2011

With the summer already upon us, it's time to start thinking about heading down to the seaside for the return of the excellent Develop Conference in Brighton. To get you in the mood for all that sun and surf and sitting still and paying attention, we've rounded up the pick of the sessions litter from each of the eight tracks on offer. Take a look over them while you pack the bucket and spade.

EVOLVE

KEYNOTE: Lessons Learned Building Moshi Monsters to 50m Users
Michael Acton Smith, Mind Candy
Mind Candy CEO Michael Acton Smith will talk about what the studio learned during its recent period of intense growth. An illuminating and entertaining session has been promised for anyone interested in online gaming, and discussions about expanding IP on new platforms.

BUSINESS

KEYNOTE: Managing the Mystery
Laura Fryer, *WB Games Seattle*
In this session VP and GM of Warner Bros. Games Seattle Laura Fryer will discuss the general creative process behind video games development, and talk about the best ways to support that creativity within business constraints, drawing on examples from her company's projects both past and present.

PRODUCTION

Being Agile in a Waterfall World
Brynley Gibson, *Zoë Mode*
Agile development is becoming an increasingly popular methodology, but the majority of projects are still signed up and scheduled along more traditional Waterfall lines. This session will examine both the benefits of, and the practical ways to bring Agile methods into this system based on practical experiences.

THE MONTH AHEAD

A look at what June has in store for the industry and beyond…

JUNE 3RD:
Hunted: The Demon's Forge is released. Testosterone levels in both genders skyrocket. World peace is abandonned. Humanity crumbles. A good time is had by all.

JUNE 7TH:
E3 starts in Los Angeles, California. Expect big announcements of things. Most likely games. Big ones. With colourful logos.

JUNE 10TH:
Duke Nukem Forever finally hits shelves. Maybe. Definitely. So they say.

JUNE 10TH:
Red Faction: Armaggedon is also released, giving sci-fi fans an interesting choice. Do you like your stories funny or serious, eh?

JUNE 11TH:
Trooping the Colour takes place at Horse Guards Parade in London. Time to get all patriotic. Unless you aren't a British royalist, in which case it is at least very colourful.

JUNE 16TH:
Bloomsday. In Dublin bibliophiles retrace the steps of Leopold Bloom, hero of James Joyce's 1922 masterpiece *Ulysses*. Tell people this and look clever.

JUNE 17TH:
Child of Eden. The follow-up to 2001's trippy computer-hacking, music/colour/sound mash-up *Rez* is set to offer even more synesthesia-based fun.

JUNE 19TH:
Father's Day. Time to tell the old man how you really feel. Go on. Get good and emotional. Tears and everything. He'll love it.

JUNE 21ST:
Summer Solstice. Enjoy it while you can everyone. It's a long, long way back down again from here.

JUNE 21ST:
Digital Content Monetization West. The second Los Angeles-based event of the month will see worldwide experts discussing monetising rich media content.

JUNE 24TH:
Grasshopper Manufacture's Shadows of the Damned is released, causing Suda 51 geeks the world over to let out a unified squeak of excitement. It'll sound awful, but quite oddly reassuring.

JUNE 28TH:
The two-day **Gamehorizon Conference 2011** kicks off in Gateshead, UK, brining together the cream of the international industry.

19-21 JULY 2011
develop in Brighton

CODING
Crysis 2 Multiplayer: A (Mostly Technical) Postmortem
Peter Hall, Crytek UK
Crytek UK principal programmer Peter Hall takes a detailed look at the development of the *Crysis 2* multiplayer; analysing what went right, what didn't go quite so well, and how the team dealt with the challenges of making a state-of-the-art cross-platform multiplayer game.

DESIGN
Turning Ink Into Brink
Edward Stern, Splash Damage
An examination of the games writing process in both theory and practice, with Splash Damage writer and designer Edward Stern. This session will be making use of *Brink* for examples of process, pipeline, narrative without dialogue and writing within technology, team and budget constraints.

ART
From Michelangelo's David to Mario's Moustache: Enhancing Video Game Art with Traditional Art Principals
Chris Solarski, Gbanga
Gbanga artist Chris Solarski highlights selected artistic principals that have developed naturally over two thousand years of human history, and how they apply to video game art in surprising and emotionally rich ways.

AUDIO
Voicing Games: The Keys To Unlock Believable Performance
Mark Estdale, OMUK
Voice and casting director Mark Estdale presents a practical workshop on getting the very best performances from voice actors. This session will unpack the actors tool box from Stanislavsky through to Method and Meisner - and share the keys that help dialogue stand out.

THE DEN
Happily Ever After: The Story of One Girl's Refusal to Delegate
Nat Marco, Honeyslug
Armed only with Google and some programming manuals, Honeyslug co-founder Nat Marco attempted to create adventure title *Happily Ever After* from scratch. This session follows her journey, and explores the new ways for designers to express themselves which she discovered along the way.
www.developconference.com

The eight conference tracks cover every facet of the modern development industry

DEVELOP DIARY

Your complete games development event calendar for the months ahead…

DEVELOP INDUSTRY EXCELLENCE AWARDS 2011
July 20th
Brighton, UK
www.develop-online.net

Every July, *Develop* hosts the biggest awards night on the industry calendar, with over 500 development luminaries attending from around the world.

This year's Develop Industry Excellence Awards takes place in the Brighton Hilton Metropole Hotel, on the evening of July 20th.

The awards are the only peer-voted prizes for UK and European developers, focusing on creativity, teamwork and innovation.

21 awards are up for grabs, covering areas like Independent Studio, Development Legend, New Download IP, Micro Studio and Creative Outsourcing.

JUNE 2011

E3 EXPO 2011
June 7th to 9th
Los Angeles, US
www.e3expo.com

JULY 2011

MCV GAMESFIVES
July 1st
London, UK
www.gamesfives360.co.uk

GAMEFEST 2011
July 14th to 15th
Chelsea FC, London
www.microsoftgamefest.com

DEVELOP CONFERENCE
July 19th to 21st
Brighton, UK
www.develop-conference.com

DEVELOP INDUSTRY EXCELLENCE AWARDS 2011
July 20th
Brighton, UK
www.develop-online.net

AUGUST 2011

SIGGRAPH 2011
August 7th to 11th
Vancouver, Canada
www.siggraph.org

EDINBURGH INTERACTIVE ENTERTAINMENT FESTIVAL
August 11th to 12th
Edinburgh, Scotland
www.edinburghfestival.co.uk

GDC EUROPE
August 16th to 18th
Cologne, Germany
www.gdceurope.com

GAMESCOM 2011
August 17th to 21st
Cologne, Germany
www.gamescom-cologne.com

SEPTEMBER 2011

CLOUD GAMING USA
September 7th to 8th
San Jose, USA
www.cgconfusa.com

DEVELOP QUIZ
September 14th
Sway Bar, London
www.develop-online.net

EUROGAMER EXPO 2011
September 22nd to 25th
Earl's Court, London, UK
expo.eurogamer.net

OCTOBER 2011

GAMES MEDIA AWARDS 2011
October 13th
Bloomsbury Ballroom, London
www.intentmedia.co.uk

GAMECITY
October 25th to 29th
Nottingham, UK
www.gamecity.org

LONDON MCM EXPO
Oct 28th to 30th
ExCeL, London
www.londonexpo.com

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JAGEX

BETA

DEVELOPMENT FEATURES, INTERVIEWS, ESSAYS & MORE

"We have seen a dramatic rise in interest in the radical alternative."
Chris Doran, Geomerics, p34

The new Develop 100 revealed

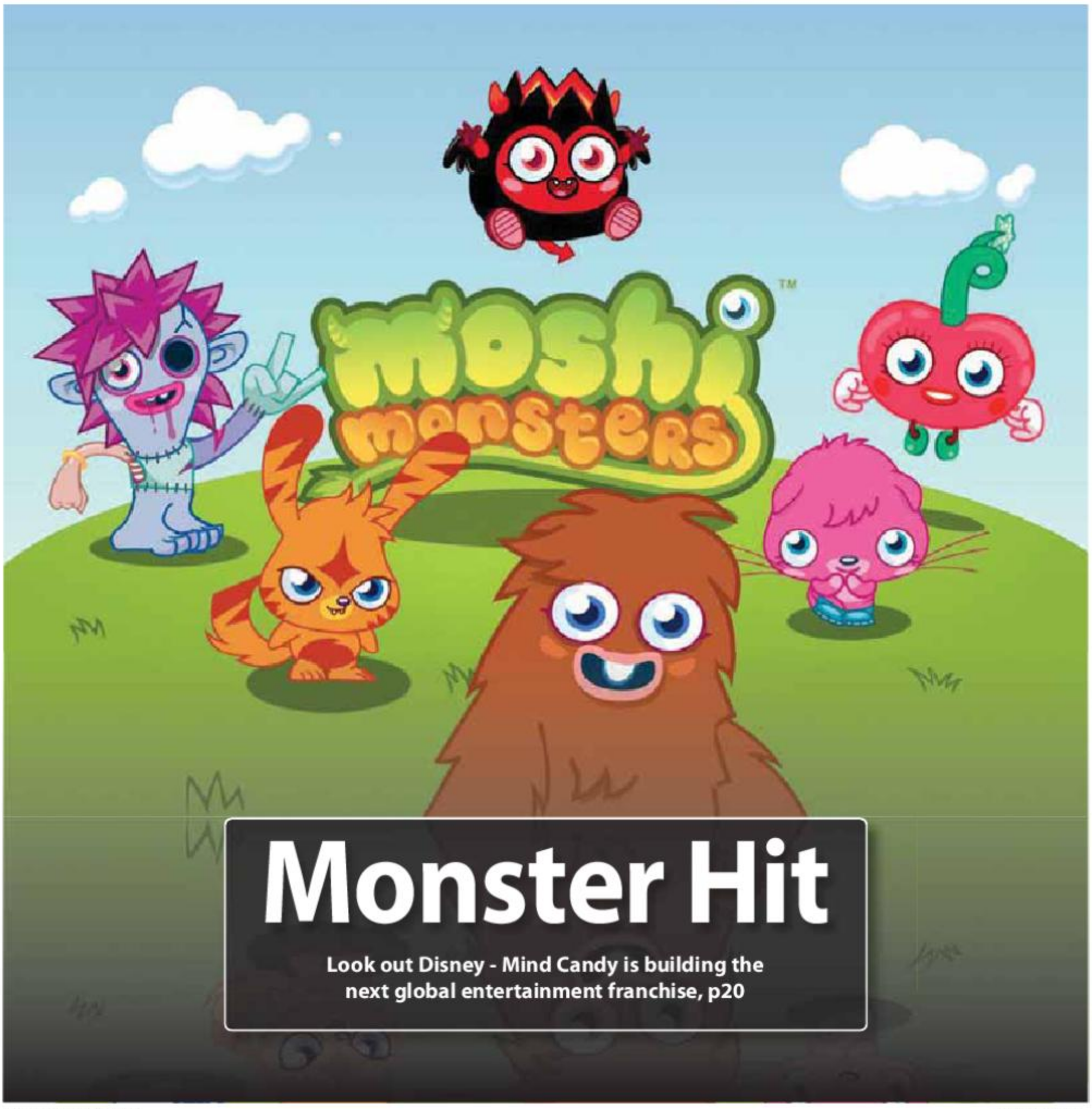
p24

Up close with Havok Behavior

p33

Real-time CryEngine 3 development

p40



Monster Hit

Look out Disney - Mind Candy is building the next global entertainment franchise, p20

Mind OVER MATTER

Moshi Monsters creator Michael Acton Smith tells **Michael French** the story of how Mind Candy beat obstacle after obstacle to build one of the hottest properties in games

So honest is founder Michael Acton Smith about the close shaves his Moshi Monsters empire has had over the years, this article may as well be titled 'How Mind Candy Won By Failing Over And Over.'

Mind Candy is definitely a winner. The London-based studio, which employs over 100 permanent and part-time developers, has become a hot property in games and the wider online tech world – and for good reason. Its virtual-pet-meets-games-meets-social-network *Moshi Monsters* has over 50m users worldwide, with money made from subscriptions and licensing. Merchandise and spin-off products are popping up everywhere – in Sainsbury's, on the App Store… and hopefully soon on cinema screens.

Acton Smith himself is Willy Wonka made flesh – a messy-haired, focused inventor of what amount to 'virtual sweets', but with a real youthful, playful personality. No wonder, then, that he's the first to blurt out that it wasn't always so good for Mind Candy when *Develop* catches up with him in London.

THE GOLDEN TICKET

As an entrepreneur, Acton Smith cut his teeth with the founding of famed UK gadget estore Firebox, but eventually moved on, hoping to bring together his passion for games, the web and business into a new venture.

"My big love has always been gaming. In 2003 I wanted to explore the intersection of gaming and the internet."

And so Mind Candy was born. "And we raised lots of venture capital for *Perplex City*."

Although dubbed 'a global treasure hunt' with multimedia content, physical goods sold at retail (predominantly through Firebox at first), the game was faithful to its name.

"Creatively it was amazing, but it was way too complicated – people don't want to consume their story across all these different mediums. Eventually, I had the worst feeling you can get as an entrepreneur. I felt awful – a real aching in the pit of my stomach. I realised that this was just the wrong thing.

"We were burning thousands of dollars in salaries a month. I went to the board and said 'I know you've invested $10m in this, but it's not working'. We had a choice – burn through the cash until we ran out, or try this little kids game I was thinking about. They were shocked, but to their credit they said to go for it. We spent the remaining $1m on that."

Moshi Monsters was the result, built in 2007. For many success stories, this is the juncture where cash starts pouring in. The day is saved with that last roll of the dice.

Not quite. "We sold toys to access it, the only way to get in was have a code from the toys. But it just didn't work. Retailers wouldn't stock it, and we were getting around two sign ups a day. It was a very solo experience – you adopted a monster and looked after it.

In April '08 Mind Candy took a new gamble, making *Moshi Monsters* free to access.

"We had to stop asking kids to pay, make it free, and worry about the commercial stuff later. We went from a handful sign-ups a day, to 5,000 a day. It grew dramatically in 2008."

Still no cause to unpack the bunting just yet – "By the end of 2008, we had no money left," explains Acton Smith. "In December 2008 I couldn't pay salaries, I had some offers from investors that were pulled – it was chaos around that time, horrible. The financial crisis scared away a lot of investment."

"I didn't know what to do. I still believed in the business, and we had a bit of traction."

A last-minute meeting with an angel investor saved the day.

"He didn't know much about games – but the big driver was that his kids played *Moshi Monsters*. He put in a bit of money which was enough to keep us going into 2009, when we launched the subscription service."

SETTING UP SHOP

That was the real 'goosebump moment', says Acton Smith.

"We switched subscriptions on, and sat there waiting… and then mums started paying. And we made thousands in the first month, doubled it the next, and so on. That's when we realised we had something special. We became cash flow positive quite quickly and have been profitable ever since.

"It was amazing to see their parents willing to pay for it – but it's because they could see the kids enjoying it and trusted it, it's a very safe environment for kids."

It helps too that the property itself is fun and engrossing. Fast forward to luxury London retailer Selfridges in early 2011, and Acton Smith saw that first hand: *Moshi* toys are on store shelves after a licensing drive kicked off in 2010, and trading card backs are sold at the till.

"I always knew that toys would make sense, but didn't really know if they would sell. But I was in Selfridges and there were two kids and their mum fighting over the trading cards. She gave in and just bought them a handful. Seeing that energy and excitement… it's clear we can build a global entertainment brand, not just a little website.

> ***"I always believed in it and knew it'd work given enough time. Yes, it's taken a long time to get to this point. We've had several dead ends along the way."***
>
> Michael Acton Smith

"I always believed in it and knew it'd work given enough time. Yes, it's taken a long time to get to this point," says Acton Smith. "We've had several dead ends along the way.

"But that's the beauty of building an online game versus a boxed one. Instead of building what we think someone wants, we can make what they actually want by constantly tweaking the direction we are going with. We take all the data and feedback, and marry that with gut instinct."

Having shot past the 50m user mark, Mind Candy says one user a second signs up to the site. Subscriptions of £5 a month or £30 for the year are the main revenue drivers, propped up by proactive licensing forecast to be bringing in $100m dollars in gross sales from merchandise.

MOSHI: THE CONSOLE GAME

WHILE MUCH of Mind Candy's *Moshi* work centres on the online service's games and merchandise, the next big move is onto handheld games consoles.

"A lot of people say the console market is challenging and tough – and it is compared to online – but it's full of opportunity with the right IP," says founder Michael Acton Smith.

So later this year, the firm will release a DS spin-off from *Moshi Monsters*.

"When we look at new areas to take *Moshi* into we look at wheter it makes sense to license it, or do it ourselves. For books, we chose Penguin; for trading cards, Topps was the obvious partner. But games we have to do ourselves, it would be wrong to farm that out. It just makes sense to control it ourselves. So we will become a publisher in the classic sense, and release our own DS game.

"We've hired a studio called Black Lantern to handle the development of it, and we will publish it. We've never done anything like this before, but have hired a great producer with lots of games experience to work with Nintendo and do things like buying cartridges and passing LOT checks.

"We're looking at a Q4 release, it will be marketed heavily and have an international launch. We wanted to keep the first game relatively simple, although we first had ideas to link it to the site – but we didn't want to just port the site to the DS. So this is a new type of *Moshi* experience."

The DS game will be just the first step, he says: "We're already thinking about what we do next in video games – I'd love to do something on 3DS and think Kinect is perfect for Moshi. And obviously iPad and iPhone too."

CAN MONSTERS FLOAT?

AS IS often the case for any successful games or online business, Mind Candy is frequently the subject of speculation about potential IPO or acquisition.

Founder Michael Acton Smith doesn't seem that interested, though – not for the time being, anyway.

"We get appraoched all of the time by companies wanting to acquire us," he explains to *Develop*.

"But we think we have a huge amount of growth ahead so it isn't the right time to sell.

"Plus I'm having way too much fun – why would I want to go to a big corporate?

"But we are funded by venture capital, and those investors will want an exit to appear at some point.

"So, I guess that's a long-winded way of saying 'maybe, but not right now'.

"And I think, generally, people sell out too early. It happens all the time with European entrepreneurs and game studios; they get amalgamated into the mothership, and are gone. But if there's ever a ripe time to build the next big online entertainment firms, it's right now and as an ambitious, independent company with great IP."

That's the other not-so-secret *Moshi* success: pushing the strong IP beyond its game confines. *A Moshi Magazine*, launched earlier this year, is already the best-selling kids magazine in the UK after three issues. Mind Candy has started its own 'Moshi TV' YouTube shows to support the site, with users as the star subjects.

"It's building and building – I was in Hollywood recently trying to do a deal for a movie, we're making more and more toys, and I want to do a live tour," says Acton .

"When you have valuable IP – and this is something video game companies haven't done as well as they could – you have to find ways for it to be enjoyed on other platforms. Just look at *Pokemon*, *Harry Potter*, *Star Wars*. But we want to be the first that does that for the digital generation, with the website at the heart of the property."

UNIVERSAL APPEAL

So despite the trials and tribulations, how have the *Monsters* survived? A simple glance offers one obvious answer. *Moshi Monsters* has an intrinsic quality – its art style is memorable and clear, the content is playful, funny and full of very British puns, but it has universal appeal.

"It's how Disney have tried to craft their films, or Henson made his characters," offers Acton Smith. "We've taken that and married it with deep understanding of the social web to create an experience that kids love."

Acton Smith says the core appeal to the site is actually quite obvious; just overlooked by many.

"The penny drop moment for us was when we realised kids love to show off online just as much, if not more, than adults. But no one had built the service for them."

However, "we couldn't have made that without the characters, or vice versa", so that great design married with the core understanding of the web forms a virtuous circle for the firm.

"From a simple idea, and with a small amount of capital – you can build a very global business."

AMERICAN IDOLS

And global is right. The next challenge is to crack America.

"We're very ambitious and want this to be a global entertainment brand – America is important for that and it is a tough market to crack. Paying users and sign-ups has been slower than in the UK – although have more users in total in the US, per capita UK is still a bigger market."

But the US market is starting to wake up to Mind Candy and the *Moshi Monsters*. More licensees are signing up all the time, and the big retailers there are showing some interest.

"It has been a much harder sell for them, partly because they see us as a UK company,

> ***"It's building and building – I was in Hollywood recently trying to do a deal for a movie, we're making more and more toys, I want to do a live tour."***
>
> Michael Acton Smith

or want it to be a far bigger no brainer hit first. But the buzz is picking up."

A big coming out party at a huge Las Vegas licensing expo this month will seal the deal: Acton Smith and his team have even picked a booth next to *Pokemon's* to show the true might of this British-born but globally focused entertainment property.

"We'll be out in force in the US – we're really rolling our tanks onto the lawn. We mean business."

OPEN SECRET

Fittingly, Acton Smith name-checks key American entertainment leaders Steve Jobs, John Lassiter and Jim Henson as heroes – a diverse bunch reflected in his personality, and his business. And also a hint as to the secret behind Mind Candy's resilience.

"What's nice about what we are doing is that we are not in just the one domain. We needed a social experience online – so needed web skills. We needed to add great stories – so needed character designers. And we needed great gameplay – so we needed great game designers."

Indeed, Mind Candy had already cracked the idea of 'transmedia' before corporate games firms tried putting it on the agenda.

"I hate that word," he says. "A lot of these companies run their franchises badly – transmedia is just a word they use to mean exploit, which itself is an ugly word to mean 'try and just make some money'. What they really want to do is consider their audience and consider their property. Don't just take a game and port it to another platform, you have to approach it in a new way. Don't scatter your story around – it sounds very exciting and clever, but no one likes engaging in that fragmented way. I learnt that with *Perplex City*.

"Some big companies get it right – just look at *Halo*. But many don't. They abuse, neglect or misunderstand their IPs.

"I would love to get my hands on something like *Call of Duty* – imagine the innovative stuff you could do for that community using content and videos that they just aren't doing right now. There's a lot for these big companies to learn from how the internet has disrupted so much of how everyone lives and engages with content and each other."

As it stands, says Acton Smith, that's the important warning that the rest of the world should take from how something like *Moshi Monsters* has continued to thrive in the face of many challenges.

"There is a big online wave coming that will hit everyone. Publishing and broadcast was shielded from much of it, but they will experience it soon.

"Music felt it deeply. And games will be the next. Not straight away, because we saw how it happened in music. But everyone should be prepared –thankfully I feel Mind Candy is well ahead in that regard."

In fact, it's well ahead of most other companies in many other respects, too.

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CRITICAL SUCCESS

Michael French examines the trends highlighted by this year's Develop 100

Who are the best games studios in the world? Who makes the best games? Who gets the most plaudits? Who deserves the kudos?

That last question is one we have tried to answer with every annual version of the *Develop 100*. Whether based on the now-narrower retail sales data or our confident judgement, the previous six editions have highlighted star performers in global games development.

Nintendo. Ubisoft Montreal. Traveller's Tales. EA Canada. Infinity Ward. Bungie. Yuke's. Rockstar North. Big studios, both in-house and independent, have formed the bulk of our listings. But in an evolving market, where microstudios and bedroom coders are seeing a renaissance, a more universal metric is needed.

This year we are using Metacritic data as the backbone for the *Develop 100*. That means for the first time, digital content plays a major part in this widely-read list, as do mobile and smartphone games. By looking at the critical reception around the 1,600+ games released last year, using the trusted, respected and sometimes controversial data tracked and monitored by Metacritic, we are able to really boil down to that first question: Who are the best games studios? This year, we've answered that question by polling the thousands of reviews published in 2010.

The result, which can be found at www.develop100.com makes for surprising reading. A few spoilers: One of those big studios above scores the top spot, but so too do a swathe of studios that would have otherwise been left out of a retail revenues ranking yet nevertheless are turning heads and rewriting the rules of the games industry.

Overall, this is a more diverse *Develop 100* than ever – and rightly so given the state of play in our trade right now. Half the list comprises of studios that have built a reputation for themselves and their brands through Apple's iPhone/iPad App Store and its rivals – the rest comprise of studios using retail releases or console-based digital distribution to grow or establish themselves.

AROUND THE WORLD IN OVER 80 DEVS

It's also the most geographically mixed listing we've ever published. 19 countries are represented in the ranking this year. Core games industry markets like USA, Japan, Canada and the UK are of course represented (with North American development teams taking up over a third of the ranking).

However, emerging markets and new hubs for games development are emerging. Teams from India, Slovakia, Spain, New Zealand, Czech Republic and Russia are in the list, as are multiple teams from Australia, South Korea, Norway France, Austria, Germany, Sweden, Finland and Denmark.

And as this is a snapshot of all the games released in the previous calendar year, this is a genuine snapshot of where the industry is right now. We've only taken 2010 releases into account, this is not a historical ranking. So while the top developers of all time according to Metacritic include Blizzard, Nintendo, Valve and BioWare, not all of them feature in the *Develop 100*.

DAVID VS GOLIATH

That last point exemplifies one of the wider trends in the industry that this more progressive *Develop 100* speaks to. There are no sacred cows. Big studios missing from the ranking this year include BioWare and Ubisoft Montreal, two of the most respected publisher-owned superstudios responsible for two of the biggest 2010 games – *Mass Effect 2* and *Assassin's Creed: Brotherhood*.

Unfortunately, they are also between them responsible for some sub-standard DLC, and some averagely-received licensed games. An aggregate system taking the average across the review scores for all those releases pushes them down the ranking and out of the *Develop 100*.

> ***"There are no sacred cows in the Develop 100. Some of the biggest studios haven't made the grade due to poor game quality."***

That will be sad news for the hundreds of staff at those studios and their similar-sized contemporaries. But in the age of the iPhone developer, the message couldn't be clearer; the move to smaller and single-man teams has redressed the balance. Large monolithic structures are great for job security and commercial reward, but credit is shared for good or ill. You can't hide in big faceless publisher-owned studios if you want glory. The good or bad work of your colleagues – whether they are sat next to you, on another floor, or at an office in another state all working for the same development studio 'brand' – will have as much impact on the credit you can claim as your own will.

However do note that it's not just a handful of larger studios that will be been victim of the simple if brutal aggregation of stats – other big commercial players with smaller team stature, such as *Angry Birds* creator Rovio Mobile (one of the big winners in the iPhone boom) are missing from the list due to their review averages falling out of our top 100.

And that pinpoints the second major gaming trend that the *Develop 100* reflects – the rise of mobile gaming and the resultant fundamental widening of the market (and in some respects redefinition of gaming). Metacritic didn't add reviews of iOS products until March this year, but its data and results track back to releases over the last few years. The inclusion of this data with the 'traditional' console world here in the *Develop 100* makes for sobering reading. As previously stated, half the studios in the list make it here due to the excellence of their iPhone or iPad games.

To some, this may be a flaw to our ranking, but it only underlines the migration to digital delivery that developers have loved. That said, iPhone reviews are still a nascent field in the criticism of games – the *Touch Arcade*s and *Pocket Gamer*s of the world are far younger and less established than the *IGN*s and *GameSpot*s that have been running for years and have been key to Metacritic's averages. But they are no less relevant, and neither is their critiques of games.

The predominance of iOS games sends out another interesting message about IP and gameplay mechanics too. iOS games are often more immediate and pure in their content and interactions they demand – a telling sign in the post-Wii era of touchscreens and camera-based tracking peripherals.

Indeed, download games (regardless of platform) may seem a risk commercially, but a risk with greater reward than the calculated 'risk' of a publisher's sanity checked new IP. Almost all the digital download games in our 100 ranking are original properties, not the over-exposed franchises we've seen over and over. That's not to say well-established game series are missing from the list, but more often than not big brands and licences mean quick commercial rewards and less critical success. Here, the *Develop 100* proves that good ideas are rewarded with critical kudos. Being able to point that out in a year where 2011's new IPs – such as *L.A. Noire* and *Bulletstorm*, and have been commercial and critical gangbusters – is as rewarding for us as a place on the 100 is for the studios in this book.

Ultimately, this industry is changing quicker than ever – and the *Develop 100* reflects that. Given the wider sample of studios, games, countries, formats and ideas reflected in the 100, I'm sure you will agree.

The Develop 100 is free with this issue or can be found at www.develop100.com with extended commentary at www.develop-online.net

develop100 1-100

POS	STUDIO	LOCATION
1	Nintendo EAD Tokyo	Japan
2	2D Boy	USA
3	ZeptoLab	Russia
4	SCE Santa Monica	USA
5	Blizzard Entertainment	USA
6	Media Vision	Japan
7	1337 Game Design	Sweden
8	Bungie Software	USA
9	Rockstar Leeds	UK
10	TheCodingMonkeys	Germany
11	One Man Left	USA
12	Jean-Francois Geyelin	France
13	Playdead	Denmark
14	Fishlabs	Germany
15	Matt Rix	Canada
16	Firaxis Games	USA
17	Dicework Games	Finland
18	Rocketcat Games	USA
19	Nicalis	USA
20	Crescent Moon Games	USA
21	Team Meat	USA
22	Gaia	Japan
23	Kojima Productions	Japan
24	Armor Games	USA
25	Hemisphere Games	Canada
26	EA DICE	Sweden
27	Art in Games	Slovakia
28	Rockstar North	UK
29	Chair Entertainment	USA
30	Retro Studios	USA
31	Game Freak	Japan
32	FreeStyleGames	UK
33	Venan Entertainment	USA
34	Treasure	Japan
35	Indies Zero	Japan
36	Good-Feel	Japan
37	Nex Entertainment	Japan
38	Kairosoft	Japan
39	Grumpyface Studios	USA
40	YoYo Games	UK
41	Curve Studios	UK
42	Ready at Dawn	USA
43	Firemint	Australia
44	JohnnyTwoShoes	UK
45	Three Rings	USA
46	Hello Games	UK
47	Revolution	UK
48	Treehouse	Finland
49	Majic Jungle Software	New Zealand
50	Sanzaru Games	USA

POS	STUDIO	LOCATION
51	Eighting	Japan
52	2K Marin	USA
53	The Behemoth	USA
54	Straandlooper	UK
55	Pixelocity Software	USA
56	Bad Monkee	Germany
57	Indeeo	USA
58	Relic	Canada
59	Arc System Works	Japan
60	Fallen Tree Games	UK
61	Grasshopper Manufacture	Japan
62	Retro Dreamer	USA
63	OtherWise Games	USA
64	Treyarch	USA
65	Mercury Steam	Spain
66	PopCap	USA
67	PlatinumGames	Japan
68	Polyphony Digital	Japan
69	Codemasters Birmingham	UK
70	Bryan Mitchell	USA
71	Crystal Dynamics	USA
72	Rockstar San Diego	USA
73	Big Pixel Studios	UK
74	Simogo	Sweden
75	Madfinger Games	Czech Republic
76	Chaotic Box	Canada
77	Lazy 8 Studios	USA
78	Cave	Japan
79	The Iconfactory	USA
80	Imangi Studios	USA
81	Project Soul	South Korea
82	HAL Labs	Japan
83	Harmonix Music Systems	USA
84	Wandake	USA
85	Funcom	Norway
86	iQubi	South Korea
87	Indiagames	India
88	TU Wien	Austria
89	Broken Rules	Austria
90	Avalanche Studios	Sweden
91	Vigil Games	USA
92	Other Ocean Interactive	Canada
93	devCAT	South Korea
94	Atlus	Japan
95	Big Bucket Software	Australia
96	Miniclip.com	UK
97	Spacetime Studios	USA
98	BigStack Studios	Canada
99	Blue Carrot Games	Denmark
100	EasyGameStation	Japan

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Thursday 21 July

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21 July 2011
indie dev day

NEW!

Thursday 21 July

The new **Indie Dev Day** aimed specifically at independent developers offers tons of sessions, a chance to meet publishers and mix with other indies. Plus, **Indie Showcase:** a dedicated area within the Develop Expo (20-21 July) featuring some of the exciting and new indie projects currently under development.

Keynote ☆
Sean Murray, Co-founder, Hello Games

INDIE
Free: Is It Evil?
Will Luton, Mobile Pie

INDIE
Starting a studio: Grad vs Veteran
Ella Romanos, Remode

INDIE
Five Tips a Developer Needs to Succeed
Jas Purewal, Olswang LLP

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WHO'S SPEAKING?

DEVELOP

Keynote ☆
The Stereoscopic 3D Experience - The First Year of 3D on PlayStation 3
Mick Hocking, Vice President, Sony Computer Entertainment Europe
Mick will reveal whether its a happy first birthday for 3D gaming on PlayStation 3 at the Odeon Brighton cinema in full HD stereoscopic 3D.

In Full 3D HD Glasses Provided!

EVOLVE

Keynote ☆
Lessons Learned Building Moshi Monsters to 50m Users
Michael Acton Smith, CEO, Mind Candy

BUSINESS

Keynote ☆
Managing the Mystery
Laura Fryer, VP and General Manager, WB Games Seattle

EVOLVE

Keynote ☆
Moving the Goalposts – Bringing Social Experiences to All Game Platforms
Andrew Wilson, SVP of Worldwide Development for EA SPORTS

ART

Keynote ☆
Showtime:
Iain McCaig, Artist and Conceptual Designer

EVOLVE
Rolling from iPhone to Console - Lessons Learned from an Independent Developer
Simon Oliver, Hand Circus

EVOLVE
45 Games in 45 Minutes: A Brisk Guide to Mobile Gaming Innovation
Stuart Dredge, Freelance Journalist

EVOLVE
Games Analytics: What We Can Learn from the Retail and Financial Sectors About Improving Customer Satisfaction and Increasing Revenue
Chris Wright, GamesAnalytics

EVOLVE
Bringing Console Quality to a Casual Audience
Drew Wilkins, fish in a bottle

BUSINESS
The Future of Games
Nils-Holger Henning, Bigpoint

BUSINESS
Sales Forecasting Techniques for Digital Distribution
Jonathan Napier, Relentless Software

PRODUCTION
Being Agile in a Waterfall World
Brynley Gibson, Zoë Mode

PRODUCTION
You Want What When? (or How Tools Saved My Life)
Jim Fowler, Sony Computer Entertainment Europe

CODING
Crysis 2 Multiplayer - A (Mostly Technical) Postmortem
Peter Hall, Crytek

CODING
Engineering the Total War AI: from Soldier to Battalion
Scott Pitkethly, Creative Assembly

DESIGN
Turning Ink Into Brink
Edward Stern, Splash Damage

DESIGN
Being Different: 5 Innovation Techniques
Mark Green, SCE Worldwide Studios Europe

ART
Digital Painting Masterclass
Cumron Ashtiani, Atomhawk Design

ART
From Michelangelo's David to Mario's Moustache: Enhancing Videogame Art with Traditional Art Principles
Chris Solarski, Gbanga

THE DEN
Happily Ever After - The Story of One Girl's Refusal to Delegate
Nat Marco, Honeyslug

THE DEN
Designing for Emotions: Understanding the Player Experience
Graham McAllister, Vertical Slice

AUDIO
Sound Psychology: Using Subliminal Sound To Prime The Subconscious Mind
Alex Joseph, Senior Sound Designer and Producer

AUDIO
Voicing Games: The Keys To Unlock Believable Performance
Mark Estdale, Casting & Voice Director, OMUK

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Tools of the trade

If you work in games development, chances are that middleware is part of your daily routine. Over the following pages some of the finest tool companies offer advice on the likes of UI, retargeting and real-time lighting

The current middleware market has flourished from its humble beginnings in less than a decade.

The modern sector is an international giant, encompassing areas as diverse as animation, lighting, audio, UI, AI, physics and a wealth of more specific disciplines such as weather and skeletal simulation.

As the middleware industry continues to blossom unabated, new hardware platforms, gaming genres and natural interaction devices are piling pressure onto developers worldwide. There are countless new methods, procedures and pipelines to master the use of, and an overlapping of techniques and technologies that requires a diversity of skills previously unseen.

Development studio models are also changing, as the return of the indie and the rise and rise of social continues unbridled. Subsequently, the onus is on middleware companies to remain flexible and ahead of the curve.

Recognising this, over the following 11 pages *Develop* brings you a number of specially commissioned pieces tackling key issues and trends from today's middleware sector. There's tutorials and guides looking at a range of subjects, including retargeting animation from tracked player data for Kinect, and designing better UI for MMOs. There's analysis on providing middleware for studios of every size, and a focus on crafting better augmented reality games for Kinect.

Contents

30 – Designing MMO UIs
A look at one of the most complex user interface specialties by Autodesk's Scaleform

32 – Kinect Retargeting
NaturalMotion offers some advice on the complex art of animating from player tracking data

33 – Character Traits
A guide to prototyping character interactions by the creators of Havok's Behaviour

34 – The Speed of Light
Geomerics compares the benefits of real-time lighting with those of the more traditional rending approach

37 – Survival of the Flexible
Middleware companies can no longer ignore the needs of smaller studios. Trinigy looks at the options

38 – Augmented Reality Check
Advice on creating augmented reality games for Kinect by BlitzTech studio Blitz

40 – Real-time Development
Crytek addresses the impact that a real-time development engine can have on the creation of a game

Designing MMO UIs

Prasad Silva, principal engineer for recent Autodesk aquisition Scaleform, offers a detailed guide to the fine art of making better user interfaces for massively multiplayer games

Prasad Silva believes that the innate intricacy of MMO UIs can, if not handled properly, have a negative effect on an entire game

The user interface can sometimes make or break a game. With MMOs, this is especially true for a number of reasons.

First, there is a significant amount of information that must be presented to the user, making the UI graphically intensive. A large number of interface elements and a lot of animation at once may slow down the overall game experience.

The many different components of the MMO UI can also easily gobble up screen real estate, if not carefully managed.

Second, gamers spend hundreds of hours playing MMOs, so usability and personalisation is extremely important.

Third, while most UIs remain constant after a game is released, UIs for MMOs can continue to be developed by both the developers and mod communities.

These factors create specific challenges for MMO UIs. Designers and artists need to determine how to present the game data with the best visual fidelity and user interactivity, while trying to avoid affecting overall game performance. Customisable and moddable UIs require frameworks and tools for creating new and editing existing content. To achieve this, such UIs require complete decoupling from the game client using an efficient bi-directional communication layer.

Because of these unique challenges, there are certain things that should be considered when developing a UI for an MMO.

ENABLING RAPID ITERATION

The design of an MMO UI must take into account look and feel, usability, and performance. For look and feel, and usability, a great WYSIWYG tool for layout and animation can provide significant value. It is quite difficult for artists to iterate and optimise UI design without visual tools.

The ability to add and test UI behaviors independently from the client increases overall productivity of both the UI and game programming teams.

Also, having a robust framework for reusable components and widgets provides a great foundation for developing and testing user interaction before integrating the UI into the client.

The Scaleform MMO Kit, designed for optimum performance and memory savings, provides an out-of-the-box UI framework for massively multiplayer online games

> ***The many different components of the MMO UI can also easily gobble up screen real estate, if not carefully managed.***
>
> Prasad Silva, Autodesk

Autodesk Scaleform provides a tight iteration loop with a full suite of UI development tools and components; artists can design in Flash Studio, quickly launch assets in the Scaleform Player to see the final result, and use the Scaleform AMP profiler to keep a tight grip on performance and memory. Flash ActionScript provides a flexible scripting language for rapid prototyping and iteration, and can be used to develop extensive component frameworks such as Scaleform CLIK (Common Lightweight Interface Kit). CLIK provides over 15 different customisable controls that are easy to 'skin' and simple to extend to introduce new behavior.

DECOUPLING THE UI AND THE CLIENT

Separating the UI from the backend code is a good practice which supports parallel development of the UI and game client and is also necessary for providing comprehensive modding support. Scripting languages allow for the modding community to create custom UI behavior and layout. Through public scripting APIs and data binding mechanisms — a process for efficiently and automatically updating UI elements to reflect the current state of the client — the UI is able to communicate with the client.

Scaleform offers good separation between the client state and the UI because it is a standalone runtime which is integrated on top of the underlying game engine. This runtime is used throughout the life cycle of the game, from UI design to development to customising and modding. Several mechanisms exist in the Flash standard for enabling communication between the backend and the UI. In addition, Scaleform provides the Direct Access API, which allows direct control over UI objects in C++ and allows developers to create high performance public APIs.

OPTIMISING PERFORMANCE

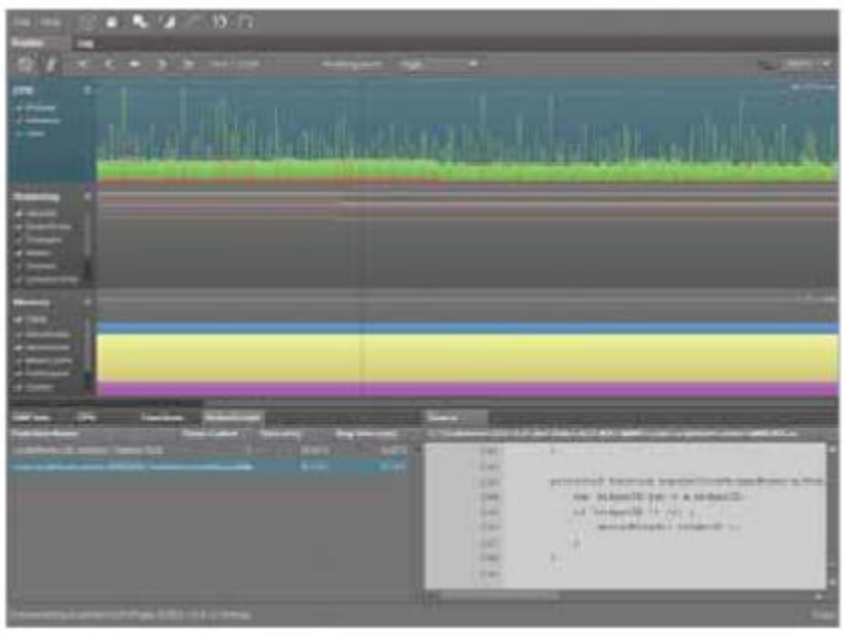
A graphics renderer with an efficient resource batching system is key to reducing the number of draw primitives sent to the GPU. Images can be automatically packed into a texture atlas as a pre-process or at runtime, to maximise batching. This approach is a definite plus, as it allows an optimised data format to be generated for the rendering engine without actively disrupting the artists' pipeline. To reduce overdraw, care must be taken when using transparency and blending effects in order to minimize the depth complexity at each pixel.

The Scaleform 4.0 renderer provides a novel batching solution, and the Scaleform AMP profiling tool makes it easier for artists and programmers to optimise content, and identify inefficiencies and hot spots. AMP monitors CPU usage, graphics rendering, ActionScript code execution and memory allocation in real-time. Using its frame-based history graphs, developers can quickly spot problem areas, then drill down to determine their exact cause.

PROOF OF CONCEPT

The Autodesk Scaleform team works closely with our customers to overcome the challenges they face in UI development, including those outlined above. As a proof of concept we created a sample MMO kit, now available with Autodesk Scaleform 4.0. Developers can use the kit as a game ready solution with minimal customisation, or simply as a best practices guide when designing an MMO UI from the ground-up.

www.scaleform.com



Below: Scaleform AMP is a sophisticated analyser for memory and performance that makes it easier for you to optimise content, and identify inefficiencies and hot spots

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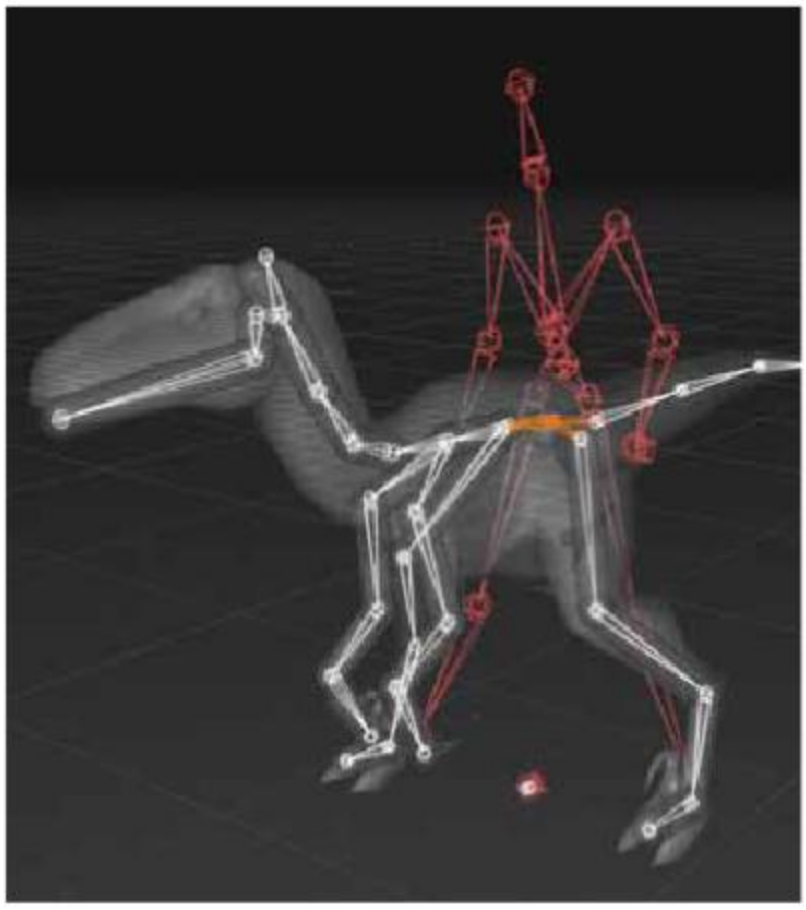
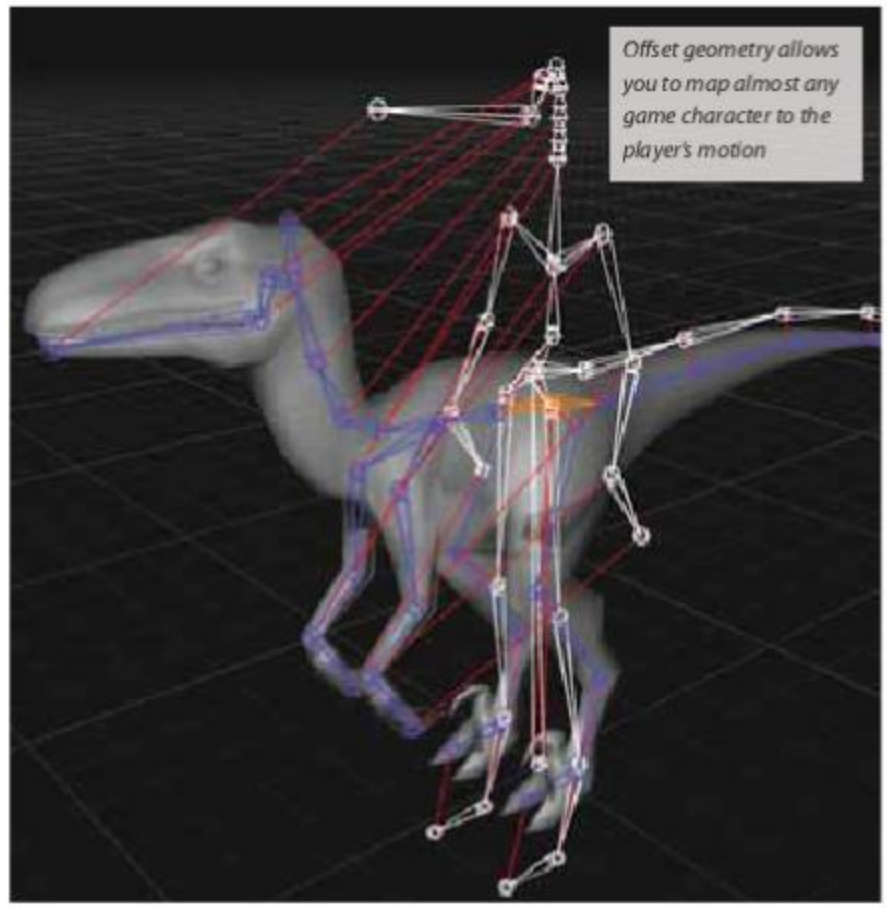
Kinect retargeting

Retargetting from a player tracked in Kinect presents a huge challenge. Fortunately, NaturalMotion's head of research **Joss Knight** is here with a wealth of advice for those looking to emrace the Microsoft device

As NaturalMotion's head of research, Joss Knight is among those at the forefront of new animation techniques





Offset geometry allows you to map almost any game character to the player's motion

The Kinect sensor promised us a higher level of immersion, with one-to-one control over the motion of our game characters. It was a concept that Microsoft dubbed 'avateering'.

In practice few titles provide this kind of direct mapping. Partly this is because gamers don't always want hero characters to track their motions – they want them to track their intentions. But it's also because of the difficulty in retargeting the tracked player, with all their variability in size and shape, performance style and their living room clutter, to the very different game character shape and posture.

In the Kinect integration for Morpheme, we at NaturalMotion think we've shown that it is possible to realise the avateering concept as originally envisaged.

Perhaps equally important, quality retargeting onto a uniform character opens up a much more natural and flexible way of defining gestures to be used to control your title – as poses and animations of the game character itself, rather than the infinitely variable player skeleton. Here are some of the main techniques we used.

Below: The tracked skeleton and (above) the resulting animation on the game character. Smoothing makes the character lag slightly behind, but a variety of tracking errors – like legs shortening or bending backwards – have been tidied up

FILTERING

NaturalMotion uses a Butterworth filter to smooth away noise, both on the original tracking data, and on the joint rotations of the retargeted animation.

Just as important are tools to transition into default animation when the tracking quality becomes poor, which can be used to handle glitches – as well as to subtly train the player to limit their actions to those the sensor can track well. You can also clean up glitches by ignoring large displacement of a tracked joint if it is too sudden.

OFFSETS

There are signifant discrepancies between the points on the player's body tracked by Kinect and the location of the equivalent joints on a typical game rig.

In particular, the 'hips' joint Kinect tracks is actually somewhere in the player's abdomen. To avoid the need to change the game rig to fit the tracker, we define offset geometry which transforms the game character's joints to the position of their Kinect equivalents. Retargeting then takes place on the transformed 'offset rig', which is converted back afterwards.

> ***"Quality retargeting onto a uniform character opens up a much more natural and flexible way of defining gestures to be used to control your title."***

Offsets are essential for getting a good quality mapping without having to change your rig.

They are also useful for handling rigs with different postures. For instance, when playing as a dinosaur character we don't want the dinosaur standing tall like the player; the offsets mean the retargeter correctly interprets the player standing upright as the dinosaur's natural stooped posture.

MAPPING

The underlying algorithm is to match the orientation of the tracked bones (lines between joints) to your game character – we can't match joint orientations because Kinect only provides world joint positions, not rotations.

Treat the retargeter as a filter on an incoming animation stream, adjusting each bone in turn to the right orientation. Where there is ambiguity, blend the orientations implied by each child bone – the hips are oriented by looking at the relative positions of the player's root, spine, and left and right hips, for instance.

One important point to note is to treat the shoulders and neck of the tracked skeleton as parented to the spine joint. Bundled software always draws the shoulders connected to the neck, which is misleading.

WEIGHTS

Do your mapping with geometry represented in the world frame, and convert back to local space at the end, starting at the root and working towards the leaf joints.

This allows you to use weights to shift rotation from a joint to its children. This is particularly useful for the hips, which will otherwise rotate when the spine ought to be bending instead, due to the way the hips are positioned on the Kinect skeleton.

RESAMPLING

To handle different character topologies we use interpolation to spread rotation to unmapped joints.

For instance, since Kinect tracks only one 'bone' for the torso we would get out rotation only at the base of the spine; but with resampling this is spread out the entire way along all the spine joints in a user-controlled way.

www.naturalmotion.com

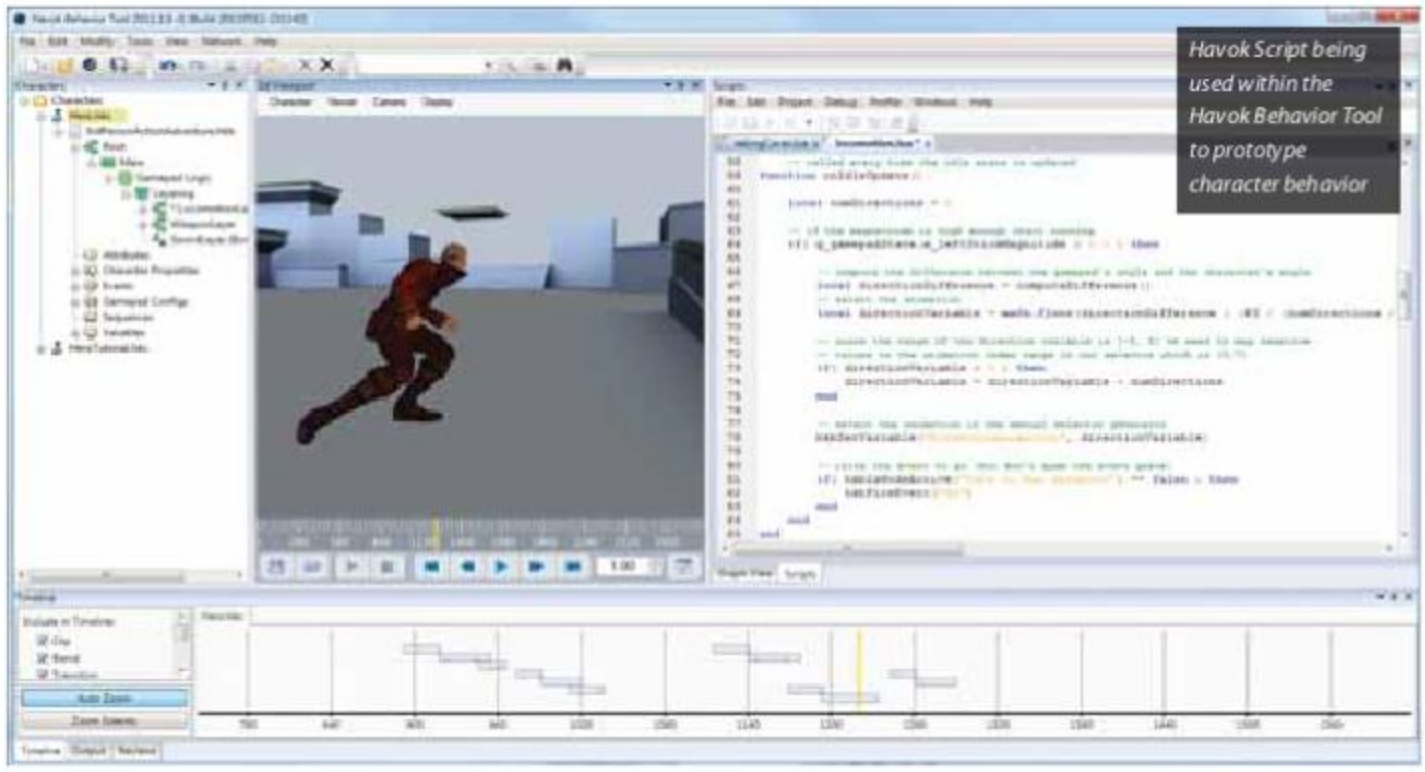
Character Traits

Jason Turbin details how the latest version of Havok Behavior, which now supports Lua scripting and can be used to prototype character interactions and help reduce risk and increase the speed of development

A common challenge in character animation is getting characters to appear and move correctly early on in a project's development cycle. In this phase, it's important that your development environment be iterative and flexible.

Typically character animation is achieved with data driven tools that often rely on a C++ back-end to drive character behavior. While computationally efficient, this method can be less than ideal because of the edit-compile-launch cycle associated with C++.

Character teams can spend months building locomotion models, attack sequences and environmental interactions to piece their characters together and place them in the game world convincingly.



Havok Script being used within the Havok Behavior Tool to prototype character behavior

QUALITY CONTROL

When implementing character locomotion, it's difficult to make a character highly responsive and still maintain high quality animation. Let's attempt to improve the fidelity of the initial movement as a character starts to run. In this example, we are integrating realistic transition animations that maintain proper anticipation and momentum. These transitions are driven by a simple interactive script that reacts quickly to input changes and is consistent with the character's orientation in the world.

First, we create a set of transition animations that begin with the character facing forward and end with the character facing in one of eight different directions (see *Figure 1*). When executing a transition, we need to pick the animation closest to the direction requested by the user (on the input stick) and then rotate the character to correct any error.

Next we focus on responsiveness. Character animations are typically authored with consistent striding for example; all animations will start with the left foot down.

A responsive character will sometimes stop in a gait where it is natural for them to lead with their right foot. In these situations leading with the left foot would cause 'foot-skate', delaying stopping leads to an unresponsive character.

> ***When implementing character locomotion, it's difficult to make a character highly responsive and still maintain high quality animation.***
>
> Jason Turbin, Havok

In Havok Behavior we address this with a simple script, executed at the start of the transition that evaluates the feet positions and selects the normal version or the procedurally mirrored version, which leads with the right foot animation. The mirroring is then handled automatically by Havok Behavior based on the results.

GREAT EXPECTATIONS

Players expect enemies to interact realistically with their environments, taking cover under fire, hurdling moving cars and clambering over buildings. Executing these features typically involves a three-step process:

■ Querying Your Game World for Annotation Information

For prototyping purposes you can expose finding interesting interaction points such as cover points or climbable ledges directly through scripting. This allows you to test character interactions quickly within a tool environment. The game runtime will naturally use more optimised versions of these queries, which gives you the best of both worlds; designers can work in a highly iterative environment, while your game runs with optimised C++ code tailored for your engine.

■ Choosing Context Sensitive Animations

Once you have developed a behavior for a specific action, like taking cover, you can then use an Animation Selector, driven by Havok Script, to refine this for more specialised situations – for example taking cover behind a wall versus taking cover behind a car. This allows art teams to quickly build more context sensitive versions of existing animations.

■ Registering the Character Correctly with the Environment

Since the user can start specialised actions from almost any location, you will need some mechanism for 'fixing up' animation at runtime to ensure they end up in the right location. In Havok Behavior a Docking Generator allows a single animation, for example a jump and grab animation, to be adapted at runtime. This single animation can be used for jumping and grabbing ledges at a range of heights. The Docking Generator also supports docking bones other than the root. For example, when vaulting you might require a character's hand be placed on the hood of a moving car at the apex of the jump.

This is just a sample of the types of animation techniques and experiments that can be rapidly prototyped inside the Havok Behavior Tool.

www.havok.com/havok-behavior

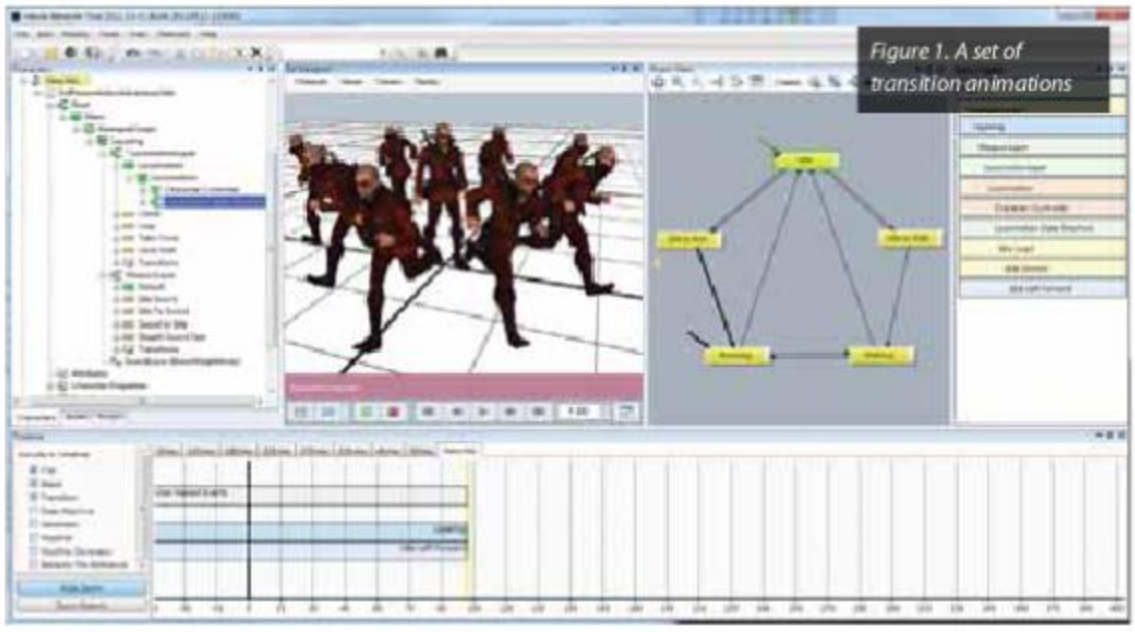


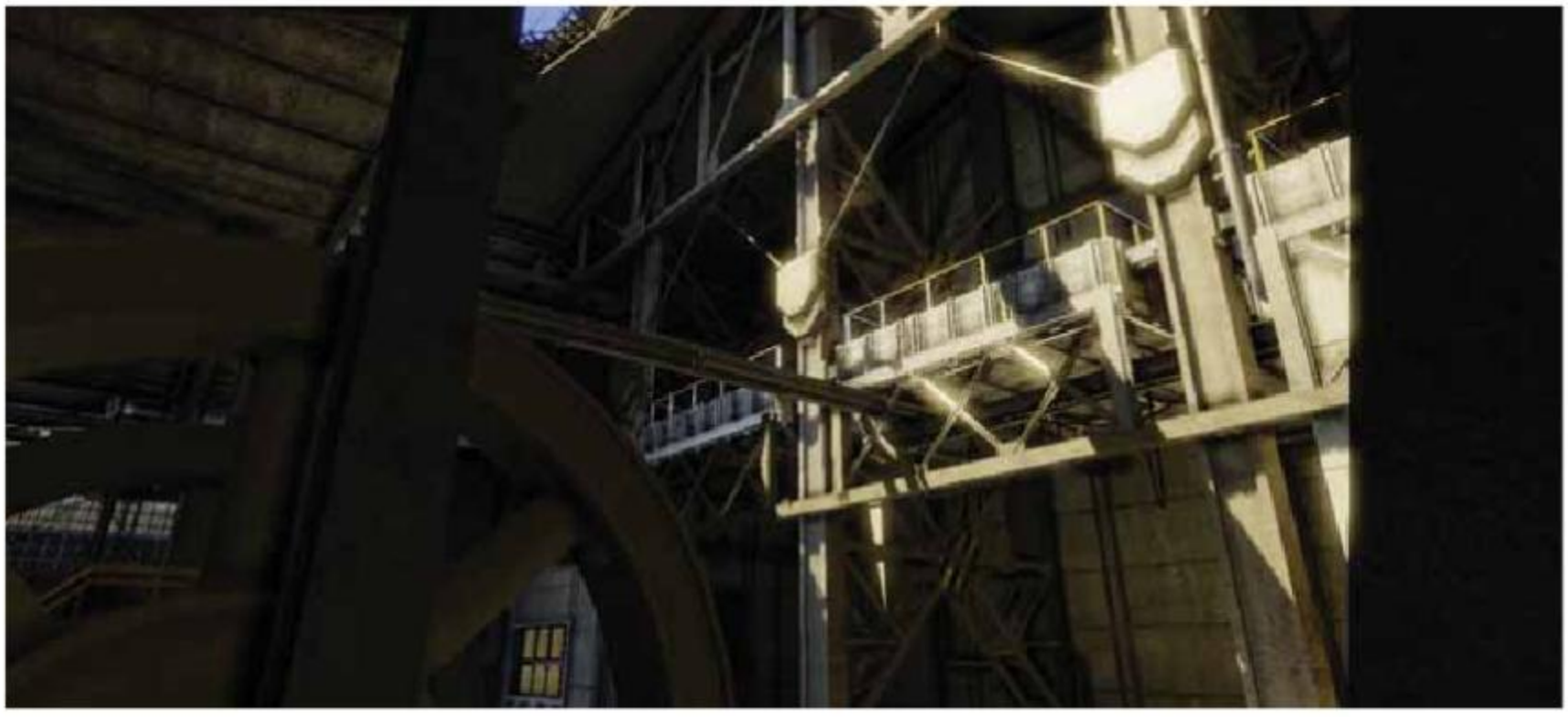
Figure 1. A set of transition animations

Havok's Jason Turbin is here to help you implement better character locomotion

The Speed of **light**

Geomerics founder **Chris Doran** looks at how the latest realtime lighting technologies shape up against traditional rendering techniques, and what artists have to gain from embracing the future

The latest and greatest realtime lighting technologies can compete with lengthy renders, argues Geomerics founder Chris Doran (above), offering impressive results



An anonymous developer, formerly of Realtime Worlds, once said: "There are two types of studio: those that believe that iteration times are important, and those that are wrong."

Studios differ enormously in how they put together their art pipelines. All want better iteration times, but many struggle to achieve this. It is difficult to distance ourselves from the belief that long asset build times are a sacrifice that must be made to achieve great visual quality. After all, surely those 12 hours of solid number crunching add value? But this is dangerous ground. Without realising it we replace the freedom and creativity our artists require with black box computation, and convince ourselves that this is necessary and unavoidable.

At Geomerics we have been strong advocates of dynamic lighting in games, but since the launch of Enlighten we have seen a rise in the number of studios using our product purely to enhance quality and productivity off-line. There is a clear requirement for tools that enable faster lighting workflow.

KILLER INSTINCTS

If you are pre-baking all of the lighting in a game level there are essentially two directions that a studio can take. The first is to devote all of the resources into high-end rendering technology. In this scheme the artist has to rely on their instincts to decide how a level will look based on crude pre-visualisations. They then hit the big 'render' button and wait. All of the final details of the scene, including global illumination, AO and other effects, are entirely reliant on the black-box rendering algorithms. Artists can become astonishingly skilled at predicting the outputs of the renderer, but they have very limited control and many find the workflow unsatisfactory. Rendering can also become a real bottleneck in game design.

> ***"Studios differ enormously in how they put together their art pipelines. All want better iteration times, but many struggle to achieve this."***
>
> Chris Doran, Geomerics

Every time a piece of level geometry is altered you have to wait for another long render before returning to testing the game. This inability to quickly iterate on gameplay and design simultaneously can seriously compromise the final game.

Many studios have developed workarounds for this problem. One typical strategy is to develop the game using a low quality render that can be updated relatively quickly. This is used for iterating on the design. When all aspects are settled the final renders are produced, often close to release. This approach is clearly viable, and good art teams can mentally envision the final render. But it is still a major compromise. Lighting is relegated to something added in the final stages, rather than an intrinsic part of the design process, and no time is left for iterating on the final look.

RADICAL ALTERNATIVES

Recently we have seen a dramatic rise in interest in a radical alternative approach. Instead of waiting for long renders, can artists take advantage of the latest realtime tools to get instant feedback on their work?

The advantages are obvious. Waiting for the final render is no longer a bottleneck in designing and testing gameplay; artists can work far more efficiently, and they can raise graphical quality. The final point is the one that surprises studios.

How can the latest and greatest realtime lighting technologies possibly compete with a 12-hour render? The answer is down to giving control back to the artist. With realtime feedback inside a world editor the artist can keep iterating until they achieve the complete look they are after.

They can vary settings interactively and mess with the laws of physics – or indeed, the laws of game lighting. If necessary, these modifications can be applied locally to provide just the right level of colour bleed, or detail in a soft shadow.

At Geomerics we are working with customers to broaden out Enlighten, offering realtime lighting both in-game and in-editor.

Even if the final lighting in a level is being baked, studios are discovering they can achieve higher quality, more quickly, by giving their artists more powerful realtime tools. The holy grail of these developments is to remove the term 'bake' from the language of games development.

We believe artists should ultimately be able to set up their lighting configuration, tweak it with instant response, and hit 'save' when they are done. With tools like Enlighten this is becoming a reality.

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Survival of the Flexible

As the rise of social and indie studios continues, middleware companies can no longer afford to ignore them. So what can they do? Trinigy's general manger **Felix Roeken** has an idea

In his interview in *Develop* last month, Valve's co-founder Gabe Newell noted: "Right now it feels to us that the games industry is changing faster than ever [...] As much as we've tried to be flexible and adaptable in the past, today it's more important than ever."

Newell's comment speaks to the tectonic shifts occurring in the games industry, all of which seem to happening at once: new platforms; new genres; new distribution channels; new monetisation strategies. To some game developers and middleware companies, the speed of these changes has spelled disaster. To those flexible enough to adapt, the changes are creating considerably greater opportunites.

Two years ago, most middleware companies were focused on game developers with large development budgets. But new mobile platforms, social platforms and distribution channels have given indie developers more outlets. As a result, the number of indie developers has swelled, and attracted the attention of 'traditional' middleware companies.

RUBBING SHOULDERS WITH INDIES

But here's the rub. Many indie developers, especially those developing for mobile and social platforms, don't have or need the development budgets that their PC and console brethren require, making them a far more price-sensitive market. What's more, the technical specs on these new platforms are new. So how do middleware companies continue to address traditional PC and console developers and the growing mobile and casual market?

The answer is flexibility. The growing number of platforms with varying technical specifications and limitations requires middleware technologies to be highly flexible at their core. Technically, middleware solutions designed from the ground up for openness and modularity have the advantage. Flexibility enables the middleware developer to implement new features, to plug-in third-party technologies, to replace libraries, without major investment. This in turn gives developers greater freedom in using a solution across multiple platforms and pipelines with fluctuating toolsets. Closed systems simply cannot handle those changes easily.

We know this from experience. When we started supporting consoles, we recognised the need for this kind of flexibility in our Vision Engine's architecture. Since then, technical flexibility, modularity and openness have been core to our development plans. This has enabled us to extend our engine to browsers, NGP and soon, mobile platforms, without huge investment or resource shifts.

There has been a lot of news lately about middleware products with pricing that address casual and mobile developers, such as Unity's per seat pricing and UDK's royalty model. While the creation of different pricing options is great for developers, it should also be noted that the need is not new. Independent developers have been around for quite some time, and so too has their need for flexible pricing.

> ***"How do middleware companies continue to address traditional PC and console developers and the growing mobile and casual market? The answer is flexibility."***
>
> Felix Roeken, Trinigy

We saw this need five years ago, and decided then to change our pricing to offer both a flat-fee model and a percentage-of-project-budget model.

TRICKS OF THE TRADE

The trick for us – and one that other middleware providers are now facing – was finding a model that enhanced rather than diminished product quality, support and those other benefits that developers of all sizes should rightly expect from a middleware provider.

Some middleware developers are turning to other revenue streams to augment lower prices to indie developers; for example an asset store. These complementary strategies could make sense so long as middleware developers continue to focus resources on their core competency, and not their secondary revenue stream.

This brings me to my final point; the shift in the gaming industry is forcing middleware developers to become more nimble. Given the shifting business models and revenue streams, we're seeing the automation of more functions, such as sales, more community-based operations, such as support, and adjunct business units to handle the various revenue streams.

Support is particularly important to developers adopting a new technology and putting it through its paces. More and more developers want to focus on developing content for their game, not on building or supporting underlying technology. Community-based support can only go so far in that process.

At some point, developers will want the peace of mind that comes in a close partnership with a middleware provider.

To a certain extent, the tectonic shifts in the games industry should come as no surprise. Game developers have always pushed technology to its limits, and have always been on the forefront of technology adoption. While daunting, the new changes bring with them opportunities for re-conceiving the middleware business and for driving the whole industry forward. All it takes is flexibility.

www.trinigy.net

Felix Roeken, general manager of Trinigy, which he says has long been ready for a changing industry with a flexible pricing strategy

Augmented **Reality Check**

Its BlitzTech middleware has enabled Blitz to work on some innovative game concepts. Here studio technical director **Richard Hackett** shares some experience gained making the first augmented reality game for Kinect

Blitz technical director Richard Hackett is excited about the future possibilities of AR gaming

Blitz' Kinect AR tech demo shows how interaction with digital constructs can become part of the future of motion-tracking games

At Blitz we have a history of working early with new technology, and our story with Kinect is no different. As we were there from the start with multiple titles – including one for launch – we were able to take advantage of knowledge sharing across the studio, with R&D focused on the features that our games needed. This article delves into one of those features – augmented reality, or AR.

Proving out AR was an early priority for us as we were developing *Fantastic Pets* for THQ – Kinect's first, and so far only, AR game. The possibilities that this unique technology brings to AR over a more conventional image camera promised a big step forward, so we were excited to see what we could do with it.

ADDING DEPTH

Firstly, Kinect gives real-time depth information in addition to the colour image, opening up the possibility for virtual objects to pass in front of and behind real objects in the scene, rather than simply being superimposed on top of the camera image. This is a big step forward and really increases the suspension of disbelief that is the magic of AR.

The depth information from Kinect is simply a measurement for each sample point of the distance from the sensor. In order to use this for rendering purposes the information needs to be converted in realtime to a non-linear space which is based on the game's 3D projection, and this is achieved by using a shader when copying the depth buffer.

One thing we found is that it helps to render virtual shadows for the virtual objects as that really aids grounding them in the scene. The same depth technology we developed for the object rendering also let us render virtual shadow maps into the scene and cast them on to objects in the real world.

> ***"Kinect gives real-time depth information, opening up the possibility for virtual objects to pass in front of and behind real objects in the scene."***

Another exciting new possibility was the generation of collision data from the real world. We were able to calculate game collision information from the depth data so that virtual objects could sensibly interact with reality. In-game characters avoided real-life obstacles like sofas or coffee tables – or even the player themselves – while virtual objects could bounce off of them or simply avoid them.

HIDDEN OBJECTS

Of course we only have the information from the point of view of the Kinect sensor, so it is by no means a complete view of the entire scene. For example, we can't see parts of objects that are facing in the other direction from the sensor or those which are obscured by a closer object.

This makes it practically impossible to build an accurate virtual 3D mesh of the scene in question. However, we can make use of other representations that are both easier to generate and just as useful for our purposes. Using a simpler representation enabled us to generate the information at a far quicker rate, and also to make the algorithm considerably more reliable for the different scenes.

PHYSICAL INTERACTION

To complement the techniques based on the depth information stream we use another unique aspect of Kinect – player skeletal tracking – to generate a physics skeleton that enables interaction with virtual objects via a physics simulation. For example, a player can push, smash or even catch a virtual object while seeing themselves interacting with it in the AR view.

Kinect is able to reliably track two players using a fixed skeleton hierarchy. The positions and confidence of each joint obtained from the Kinect system can be retargeted on to a physics skeleton similar to the ragdoll characters often seen coming to harm in physics demos. By adding in joint constraints and filtering we can quickly reduce the amount of noise in the signal for solid player interactions. The information can also be used to work out where the living room floor level is.

PUTTING IT ALL TOGETHER

Our early R&D experiments bringing these three techniques together were instantly compelling, so we knew we were potentially on to something. Playing these demos generated a lot of ideas for AR gameplay that were quickly transferred themselves into the games themselves.

AR on Kinect has a lot of potentital and *Fantastic Pets* is just the start – we look forward to seeing where else it's taken in the months ahead.

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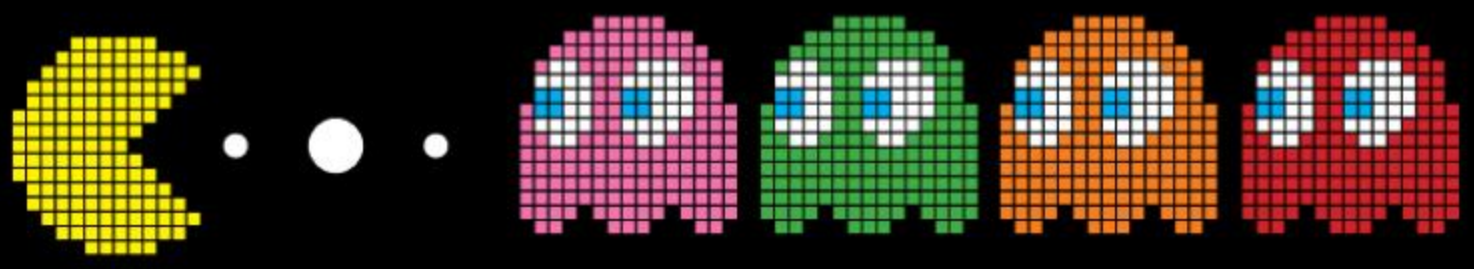

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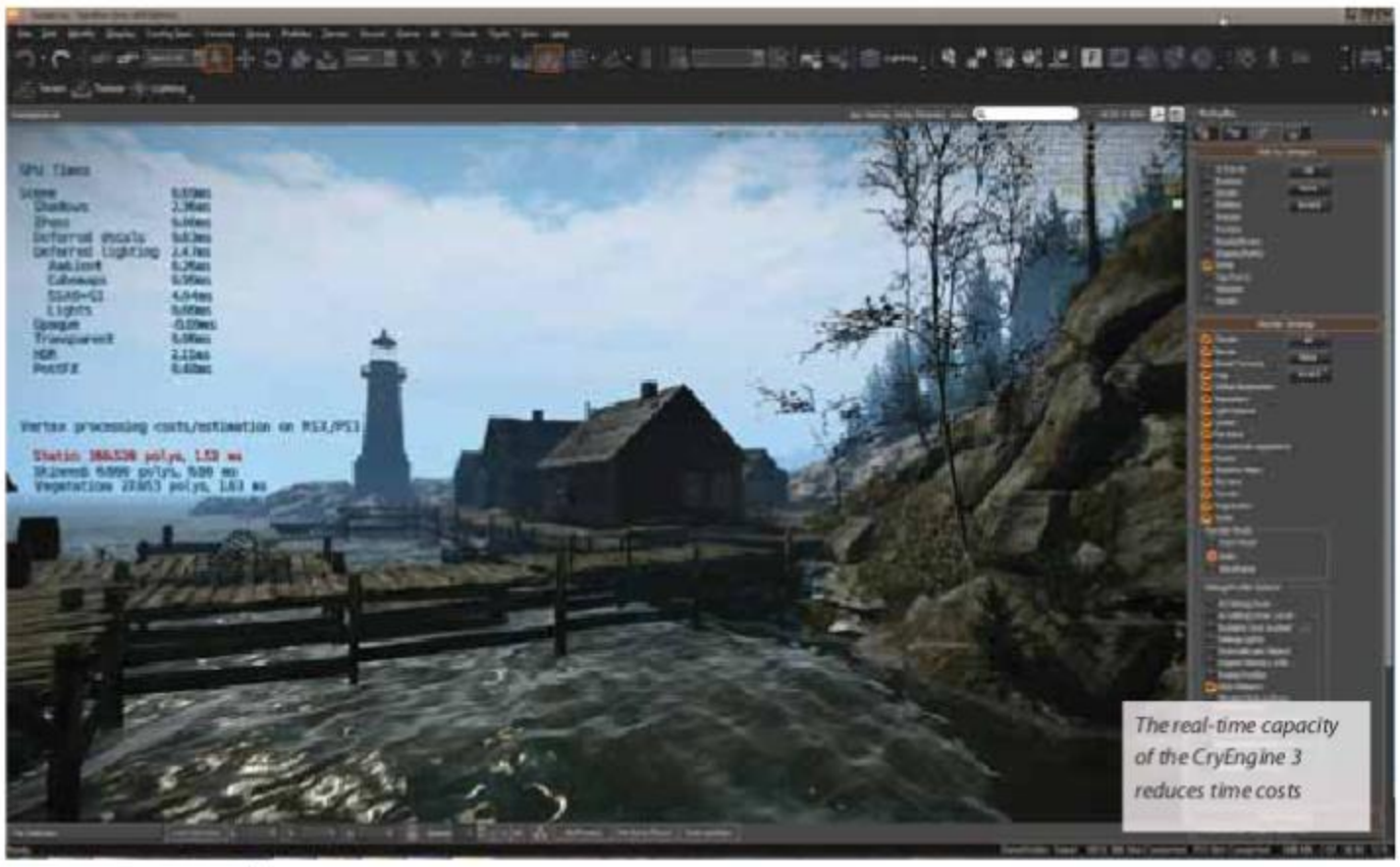
Real-time Development

Crytek's Licensing Team technical designer **Ade Esan** looks at how a real-time development engine can improve the quality of a project, from the conception stages right through to the optimisation of a project



The real-time capacity of the CryEngine 3 reduces time costs

Crytek technical designer Ade Esan advocates the benefits of a real-time development engine

As the popular statement says, 'ideas are cheap'. And why shouldn't they be? When you are given the tools and time to experiment with lots of different ideas, to find the one that really works, discarding earlier and lesser concepts is easy. In such an environment ideas really are cheap and the most suitable ideas can be chosen and developed. But let's think about when an idea becomes expensive.

Ideas become expensive when it takes a long time to implement them, a long time to test them and a long time to change them.

A real-time development engine keeps ideas cheap by reducing their time cost in all these areas. Without having to recruit the services of a programmer it's possible with CryEngine 3 for example, to create new gameplay entities; from items the player can interact with to simple AI characters, using basic Lua files. As such, the implementation cost is greatly reduced. Furthermore, it's possible to edit the Lua scripts and have the sandbox editor running at the same time.

This is extremely useful as changes to the Lua scripts will be updated in the editor and thus are ready for testing immediately. There's no need to close and reopen the editor, and the changes are propagated to other parts of the editor that interact with the entity, such as FlowGraph, our visual scripting system. The instant update and real-time feedback really does encourage tweaking and experimenting in those early stages of development.

The CryEngine 3 hard at work

> ***"The inherently iterative process of game development tends to demand a certain order to be given to tasks based on their perceived production cost."***
>
> Ade Esan, Crytek

ITERATE, ITERATE, ITERATE

The inherently iterative process of game development tends to demand a certain order be given to tasks based on their perceived production cost. Tasks that are seen as costly are pushed towards the later stages, when there can be more certainty about their implementation, as changing them could be costly. This is of course fine if there are valid dependencies, but not when the decision is due to the costly process of implementing the task. This just means a valid task gets less time than might be required spent on it.

A good example of such a process is lighting. Lighting methods that rely on pre-baked solutions or manually created shadow maps are time consuming and deliver a disjointed workflow. Real-time lighting – calculating diffuse/indirect lighting in the form of global illumination and direct

lighting from light sources using deferred rendering – drastically changes the way artists work. This improved workflow of having the ability to place a light source in the world and instantly see the final result on objects, other lights and shadows is clearly evident, but by also reducing the time cost of the task it means that the task can begin earlier in the development stage as changes that need to be made are cheaper. This gives artists time to perfect lighting in the world.

OPTIMISATION

When developing across multiple platforms, 'test it on consoles' becomes more than just a mantra. As anyone that has worked on a console product knows, this is not always such an elegant task. It typically involves lots of back and forth taking place between the PC and consoles.

With Live Create, a real-time development tool in CryEngine3, this process has been brought inline with the real-time philosophy of the engine. Running the game on all three platforms simultaneously – with edits made on the PC being propagated in real-time onto the consoles – comes into its own when optimising in the last stages of a project.

When running a project on consoles, if the developer notices performance drops, it's possible to use built in debugging tools to locate the problem (a rogue PFX or poor culling) and see in real-time if deleting, moving or otherwise replacing an entity in the editor improves the performance on the consoles. This significantly lowers the cost of testing on consoles, and displaying real-time results allows for more effective optimisation across multiple platforms.

For me real-time development is about more than amazing technical solutions to challenging problems; it's about removing the downtime in my day where I'm waiting for something to rebuild, or opening and closing programs to see changes. It's about keeping all the systems I use in sync and making my working day a smooth ride and not a start and stop operation.

In conclusion, whether you're using middleware or internal engines, any opportunity that arises where you can implement some real-time features into your engine will pay dividends throughout the whole development process by reducing the time cost of a task. You should always make time to implement time saving features; the quality of your project depends on it.

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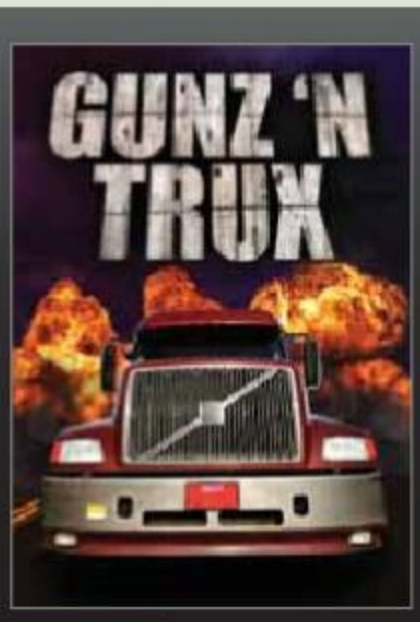

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"The characters are fantastical – some would say 'cartoony'."
Dead End Thrills, p59

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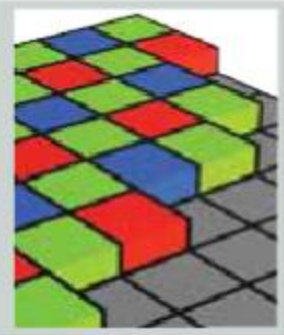

Environmentally friendly

SN Systems reveals the work that went into building the NGP developer environment, p44

EPIC DIARIES: A LOOK AT WHAT DIRECTX 11 BRINGS TO UE3, p53

UNDERSTANDING THE SYSTEM

Sony subsidiary SN Systems is the company behind much of the tech in its parent company's platform developer environments, including that of the NGP. **Will Freeman** met with some of the once-independent organisation's core staff to find out more about an outfit that has been part of the Sony family since 2005

How has SN Systems been involved in the creation of the NGP development environment?
Bernard James, VP, development: For the NGP development environment we provide the compiler, debugger, target control and performance analysis tools.

They are improved versions of what we provided on PlayStation3 and PSP. At the early stages of working on the development environment we redesigned a lot of the tools based on the feedback we had from the last five years of PS3.

The big message was that people coming into the industry from scratch had learned a lot of their bread and butter programming skills on things like Visual Studio Express, perhaps while they'd been at university, and in that circumstance they get very familiar with working in their IDE. Sometimes they can find the context switch of moving to a new IDE difficult, so it was something we wanted to address as part of the whole, 'making NGP development as easy as possible' goal.

That considered, this time we built our debugger into Visual Studio. We'd been asked for it for a long time, and we did take careful consideration over the decision. The previous debuggers were made without Visual Studio, but they provided additional features that Visual Studio didn't. It was a tough decision when we made it, but the feedback we're getting from NGP developers today has told us that it was the right decision.

So, relative to the complexity of creating a game for a new platform, there was a focus on designing a development environment that was accessible and welcoming?
Andy Beveridge, director: It's not something we're really known for, because we have a habit of targeting the power users.

> ***"For the NGP development environment we provide the compiler, debugger, target control and performance analysis tools."***
>
> Bernard James, SN Systems

We're geeks ourselves, and Martin Day – co-founder and research director of SN Systems – and I are ex-game developers, and we love the technology, so confronted with something like PS3, the first thing we think is 'how are we going to support debugging all of those SPUs, and how are developers going to use them?'.

But that isn't the first thing developers think when they first come to PS3. However, on the PS3 tools, that is the direction we went, and we added support for all the intricate hardware. The fancier it was, the more diagnostics we could show developers, and the more they could interact with. That can be different from what some developers coming to a platform would expect.

This time around we have thought about how developers pick it up and how they get started.

But then NGP, and all Sony's hardware for that matter, is renowned for power, so I presume the development environment is still relatively 'fancy'.
Beveridge: Certainly, yes, and there's still a lot more we can do, but we wanted to get the basics right first, and based on the third-party feedback we know that was the right thing to do.

And how does SN Systems distribute its development environment, and what service does it provide?
Tony Liviabella, developer services manager: They're part of the SDK so when studios get their SCE development hardware they also get access to the private developer network site that is provided. Developers can just download the tools as part of the SDK at no additional cost, as well as lots of other useful resources including forums, online private support, training videos, samples and documentation. We also have a Developer Services team in place, to provide further help and support. SCE and SN provide support engineers who, as well as offering online support, also visit developers onsite to assist in any way they can. It's all part of the PlayStation development experience and is aimed at supporting developers so they can deliver the very best games they can.

Creating development tech for a new device like NGP must be difficult. What challenges defined the experience?
Beveridge: ARM wasn't a surprise; we've worked with ARM before – albeit a slightly different ARM, so that was fairly straightforward. One of the biggest challenges for us has been the performance analysis side of things. Something that was always very difficult for us when we were independent was the GPU side. We do CPU tools. We do compilers, assemblers, debuggers and so on. The GPU has always been something that game developers really care about, perhaps more than the CPU. GPU throughput is almost everything to them.

SN Systems' work with the NGP began when it was a 'pile of circuit boards' long before its final form factor was revealed

Because we were always CPU focused, and left game development before GPUs really took off, at first we never really understood it. It was the reserve of studio tech-lead developers. Not having that in house, we just left it alone.

This is the first platform that we've actually got part of the product that is a combined CPU and GPU analysis tool, and that's been a multi-territory, multi-team development effort between ourselves, the SCE R&D departments in the US and Europe, and the first party guys (WWS – SCE Worldwide Studios). It was a lot of work, but it's been worth it for what we now have.

James: On PS3 there was a separate CPU tool called Tuner that we developed and a separate GPU analysis tool called GPAD that was developed in the US.

Beveridge: And GPAD and Tuner came out pretty late in the cycle for the PS3 as well. NGP already has all of that kind of thing within one tool.

Liviabella: It's called Razor, and although it's led by one of SN's senior guys Tom Charlesworth, it's very much a joint product bringing together a variety of experienced teams and knowledge base. At the point when we were bought by SCE there were lots of different tools that did lots of different things. We've all worked on collaborating internally to minimise duplication of work and deliver better products to developers.

Beveridge: When we were independent, we would get given our first look at a dev kit at about the same time as the first third-party developers got a look at it. In that situation our customers were already having to develop their games, and they were phoning us up straight away asking if we have any tools, to which we had to say 'no, we've only just got a dev kit'.

We needed a few weeks, and it meant a lot of shipping tools for free as betas to the developers. That was in the old days of course, and it's very different now, as well ahead of release we're able to plan what the tools are going to contain and what the schedule for bring-up should be.

How intimately do you know the inner workings of the NGP? How are you involved with the product's development?

James: I feel our job is just to make the development environment as easy to use as possible, almost to the point that it is invisible to them. The challenge from there is one that is the game developers', but if we don't do a good job, it doesn't allow them to go ahead and make the most of what the hardware offers.

> ***"The GPU has always been something that developers really care about, perhaps more than the CPU. GPU throughput is almost everything to them."***
>
> Andy Beveridge, SN Systems

Beveridge: We are pretty obsessed with the tech at a very low level, so really we're not involved with a console as such. We don't even see a console; we see a pile of circuit boards. We essentially don't see the touch sensors or fancy screen.

James: Of course there are parts of the system that our tools have to interface with. In the past we had no influence over the design of a system, which meant there were constraints our tools had to work around. This time, with the NGP, while it hasn't been easy, we have been in early enough to work with those other teams on parts of the system that are in the hardware that effect us. Those are guys with their own challenges and their own deadlines, but we, and Andy in particular, have been to Japan so many times for fairly long periods.

We've got very good working relationships with them, and they very much understand our perspective when we ask them to put a certain change in that they may not think is needed.

Would it be fair to say, then, that there has been a more collaborative approach to developing the NGP and its development environment than with previous platforms?

Liviabella: Most definitely, lessons have been learnt and we're all very much working towards one goal. Different teams in different regions all have a duty to communicate and ensure we're working in the same direction. We've certainly established some very important relationships with different development teams and studios across the world. In fact, many of the lessons and changes we've made to NGP have made their way into our PS3 tools as well. Let's not forget, PS3 is still very much a huge priority for us and we have lots of great titles still yet to be released, so anything we've learnt from NGP is usually transferred to our PS3 development environment as well. Like any merger or take-over, there's a learning curve and it can take time, but time has moved on now and we're very much part of the PlayStation development network.

www.snsys.com

Top: The SN Systems team (left to right) Andy Beveridge, Bernard James and Tony Liviabella, who were involved with NGP (insert) at a very early stage

KEY RELEASE

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PRICE: Starts at €3,500 for a half-year license
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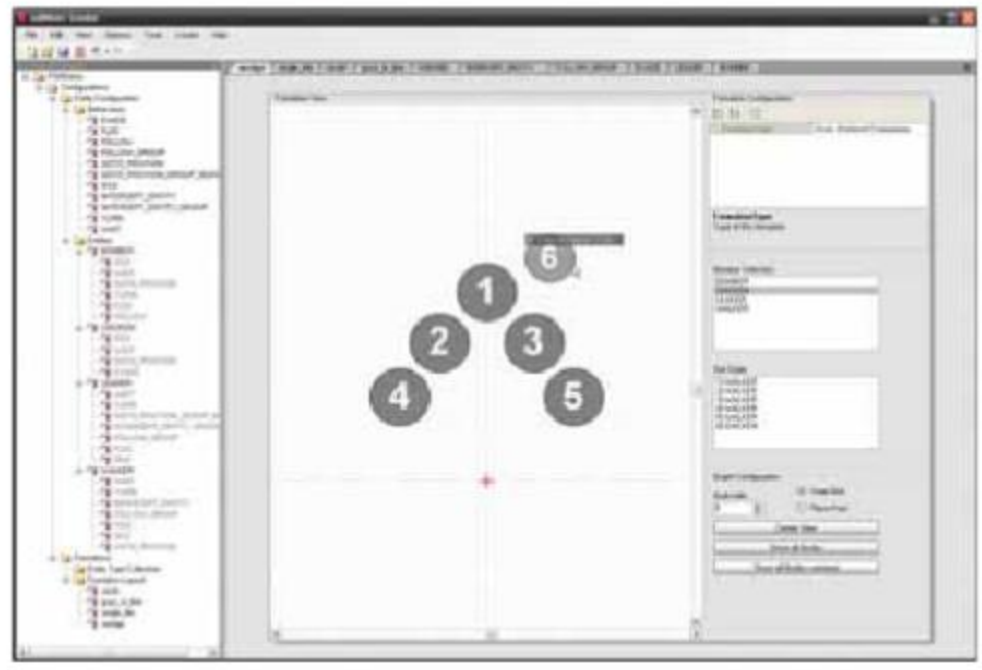


Xaitment's group CEO Dr. Andreas Gerber (above), and various elements of the BrainPack 2011 AI bundle in action (top and below)

Artificial Intelligence is something that every studio has a different definition for," says Dr. Andreas Gerber, group CEO of AI tech firm Xaitment.

"One of the things that we have learned over the years is how others understand AI in games. Often, potential customers have said to me that their game has no AI. In discussion, it always turns out to be different.

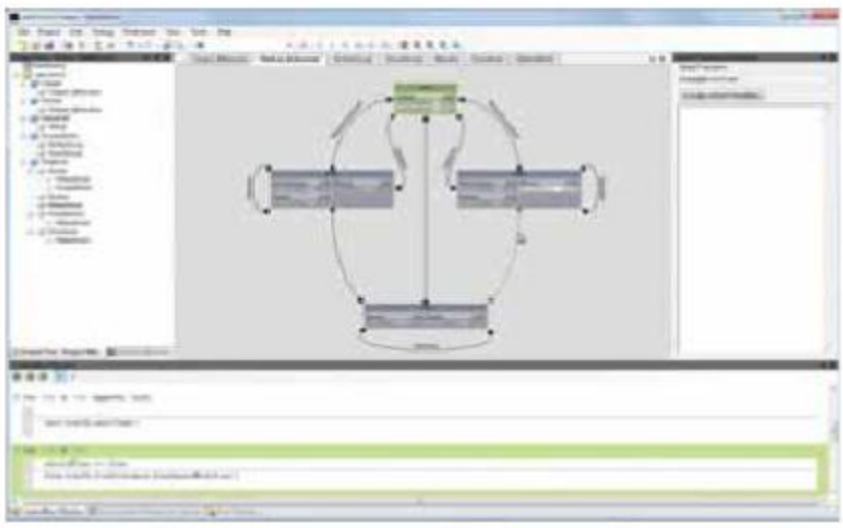
"Every game is about characters and objects moving around. To do this, you need a pathfinding solution as a very basic feature."

Xaitment's BrainPack 2011, the latest AI bundle aimed at studios and projects with limited budgets, highlights the company's ongoing attempts to modernise the general way smaller developers think about artificial intelligence. The package contains three of the firm's best selling AI tools, XaitThink, XaitControl and XaitKnow.

"The BrainPack 2011 is a special licence model to address the fact that game productions have to be faster and cheaper but at least the same quality," Gerber says.

"We talked to a lot of studios and found out that one reason to do everything internally was because of their budgets. The BrainPack starts at €3,500 for a half-year license and €6,000 for a one year license. During that period you can use the full version of XaitMap, XaitMove and XaitControl for your game developments.

"There is no limitation in the number of games you can produce using our products. Once you have brought our BrianPack, you can use the runtimes for those games you have created under this license perpetually."



FROM THE ASHES

In an industry that is still suffering from the after effects of a financial crisis that coincided with a fundamental groundshift of business focus, Gerber believes that Xaitment's latest tech offering is as timely as it is substantial.

"Due to the financial crisis and the massive loss of money in the past, publishers and game studios have told us that publishers and financiers are no longer willing to spend money in internal game engine development," he explains.

> ***"The BrainPack 2011 is a special licence model to address the fact that productions have to be faster and cheaper."***
>
> Andreas Gerber, Xaitment

"They want to spend money for gameplay, not for technology. They have learned that there are enough commercial and well supported engines on the market maintained by experts. Also, the trend towards smaller games raises the need to offer a license to support smaller game budgets and faster development times.

"So we decided to create a bundle to help our customers with the best technology on a low budget. With the one year licence, we believe your investment will return to you in one man-month. Implementing and optimising a pathfinder from scratch is longer than this, but the BrianPack offers three products in one."

LEAN ON ME

Gerber also outlines the various levels of support packages that are available to BrainPack customers, detailing a flexable system that tailors itself to its users needs.

"The BrainPack 2011 includes a standard support package, which we developed together with our customer, asking them what they really needed. This ensured our customers will get free updates and upgrades during the runtime of the license and they will have full access to our support knowledge base and our moderated support forum.

"We believe that out of our support crowd there will be tons of good ideas and tips. Last year we installed a moderated forum on our website and started a fast, easy to use support system. This means we can help the community and discuss things in an open way with the community."

FACE IN THE CROWD

In a busy marketplace, it takes something a little extra for any tech bundle to stand out from the competition. According to Xaitment's CEO Dr Andreas Gerber, however, the BrainPack 2011 AI bundle has no trouble in that department.

"Our products are optimised for different platforms and you can book our world-class support team whenever you need help," he explains.

"As Xaitment is a middleware company that has focused solely on AI for over seven years now, we have senior experts that can assist any team. We can guarantee very fast response times to questions as well as feature requests at any time."

Gerber also points towards the many middleware partners that Xaitment is working with as a futher benefit to making use of the company's tech.

"We have integrated our editors and runtimes into many game engines like Trinigy's Vision Engine and vForge editor, Gamebryo's Lightspeed Engine and Toolbench editor, or have interfaces ready to use for Unity 3D Pro, Unreal and the like. Integration into your game is only a matter of hours; not days or weeks."

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SEE EXCERPT ON PAGE 56

250 Indie Games You Must Play

Mike Rose

Price: $29.95 / £17.99
Cat. #: K13514
ISBN: 9781439875742
Publication Date: April 21, 2011
Binding: Paperback

With a surge in popularity recently and an increase in great downloadable games, there has never been a better time to learn about independent "indie" games. 250 Indie Games You Must Play is a guide to the exciting and expanding world of indie gaming. Whether you are a veteran of the indie game scene or have never played an indie game before, this book helps you experience the best in indie gaming and further your understanding of why indie games are so important in the entertainment industry.

The wide range of games highlighted in the text encompasses concepts and ideas that will change your perspective of what video games can be. The book covers puzzlers, platformers, beat 'em ups, shoot 'em ups, role-playing, and strategy.

Apart from being fun, indie games can be experimental, emotional, nostalgic, and occasionally just plain bizarre. Some make you sit back in awe, while others have you thinking, "Why have I never played a game like this before?" Better still, the majority of these games are completely free to play and even the commercial releases are incredibly cheap. Once you start playing indie games, you may not be able to look at your big-budget blockbusters the same way ever again.

The Golden Age of Video Games: The Birth of a Multibillion Dollar Industry

Roberto Dillon,
Digipen Institute, Singapore

Price: $39.95 / £25.99
Cat. #: K13396
ISBN: 9781439873236
Publication Date: March 23, 2011
Binding: Paperback

This book focuses on the history of video games, consoles, and home computers from the very beginning until the mid-nineties, which started a new era in digital entertainment. The text features the most innovative games and introduces the pioneers who developed them. It offers brief analyses of the most relevant games from each time period. An epilogue covers the events and systems that followed this golden age while the appendices include a history of handheld games and an overview of the retro-gaming scene.

Creating Games: Mechanics, Content, and Technology

Morgan McGuire,
Odest Chadwicke Jenkins

Price: $69.00 / £43.99
Cat. #: K00377
ISBN: 9781568813059
Publication Date: December 23, 2008

Creating Games offers a comprehensive overview of the technology, content, and mechanics of game design. It emphasizes the broad view of a games team and teaches you enough about your teammates' areas so that you can work effectively with them. The authors have included many worksheets and exercises to help get your small indie team off the ground.

GPU Pro 2

Wolfgang Engel,
Confetti Special Effects

Price: $69.95 / £49.99
Cat. #: K00418
ISBN: 9781568817187
Publication Date: February 14, 2011
Binding: Hardback

This book focuses on advanced rendering techniques that run on the DirectX and/or OpenGL run-time with any shader language available. It includes articles on the latest and greatest techniques in real-time rendering, including MLAA, adaptive volumetric shadow maps, light propagation volumes, wrinkle animations, and much more. The book emphasizes techniques for handheld programming to reflect the increased importance of graphics on mobile devices. It covers geometry manipulation, effects in image space, shadows, 3D engine design, GPGPU, and graphics-related tools.

Game Design: From Blue Sky to Green Light

Deborah Todd

Price: $49.00 / £31.99
Cat. #: K00629
ISBN: 9781568813189
Publication Date: February 23, 2007
Binding: Paperback

This book takes a real-world, in-depth journey through the game-design process, from the initial blue sky sessions to pitching for a green light. The author discusses the decision and brainstorming phase, character development and story wrap, creation of content and context outlines, flowcharting game play, and creating design documents. Special features include examples of both classic and contemporary games, and interviews with many of the game industry's brightest professionals who share their insights on key elements in game design, and their analysis on what makes a game a blockbuster hit. This book is a perfect guide for the novice, student, and game enthusiast interested in learning the nuts and bolts of the computer-game industry.

Game Engine Gems 2

Eric Lengyel,
Terathon Software

Price: $69.95 / £44.99
Cat. #: K13208
ISBN: 9781568814377
Publication Date: February 14, 2011
Binding: Hardback

This book, the second volume in the popular Game Engine Gems series, contains short articles that focus on a particular technique, describe a clever trick, or offer practical advice within the subject of game engine development. The 31 chapters cover three broad categories–graphics and rendering, game engine design, and systems programming. Professional game developers, students of game development and computer science, and anyone interested in learning how the pros tackle specific problems that arise during game engine development will find useful gems in this collection.

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Democratising Mocap

Motion Capture used to be the exclusive reserve of triple-A game budgets. Today that is changing, argues NaturalPoint co-founder and lead engineer **Jim Richardson**

The variety of modern mo-cap hardware, from the likes of the Insight VCS (above) to the VCS:Mini (right), means that a broader range than ever before have access to the technology

THE MOTION capture market is reaching a tipping point in maturation that, like most hardware-driven industries, is resulting in an exciting democratisation of the technology.

That which was previously exclusive to big budget productions and marquee studios is now available to indie game developers, community colleges – even hobbyist animators.

This democratisation process is the result of numerous factors, including the emergence of new vendors, improvements in product design, streamlined business models, and even advances in computer processing for handling mocap data. But just as important is the understanding that we, as technologists, can be collaborators in the creative process. Designing with this in mind is a core accelerant to the increase of technological accessibility.

A CLEAR MESSAGE

In addition to fair pricing and ease-of-use, vendor transparency is vital to the spread of mocap as a technology. Valuing transparency means posting your pricing online. Making raw, unedited sample data freely available. Getting your technology in front of people at trade shows. Providing free technical support. Offering the community access to your architecture through SDKs. These practices are fundamental to how we market and support our products. We take these steps because, as consumers ourselves, it's what we expect out of companies that we purchase from.

For many studios, the motion capture experience has been similar to Panavision cameras – only available for rental, and at a daunting price point. Enter the Red One camera, which can be purchased for less than a Panavision rental fee. Or go back even further and look at inkjet printers. It wasn't too long ago that you went to a blueprint shop to have your drawings plotted or to have high resolution colour images printed on the laser printer. And we know where that story ends.

Agile new technology providers are now pushing mocap in the same direction that Red took digital cinematography. Price the product affordably, prioritise ease of use, and watch the market grow.

> ***"Agile new tech providers are now pushing mocap in the same direction that Red took digital cinematography."***

When we started selling our OptiTrack motion capture line in 2007, many believed that the potential market was too small, and that service bureaus were still the way to go. That motion capture was just too complicated, and the technology was too expensive. But we've identified a growing market for mocap. Customers just need reassurance that the technology really is approachable, and the price points are realistically manageable.

KINECTED MOCAP

With millions of units sold already, you can look to the success of Microsoft's Kinect as the ultimate validation of our market's potential. In the short time that Kinect has been on the market, numerous home-brew motion capture applications have sprung up. You can even pipe Kinect data directly into MotionBuilder, for basic body tracking at a price that nobody would believe a few years ago.

If you're looking for production-quality data, your mileage may vary, but the fact that people are so hungry for motion capture is really exciting.

However, we don't think of this democratisation process as only applying to indie developers and hobbyists. Even the largest studios are shifting their mocap paradigm. Instead of reserving time at a single, massive motion capture facility, many satellite studios are creating their own capture systems – perfect for previsualisation and more flexible iteration throughout the entire production process. This workflow wasn't possible when mocap studios cost $250k, $500k, or more to build, but for $10-to-$20k, a radical shift in how large companies create content starts to make serious fiscal sense.

When you look at our now maturing motion capture market, you see natural a segmentation developing. Technology is advancing very rapidly, and new businesses are taking advantage.

As a result, consumers finally have a choice – there is a clear difference between certain segments of the market in terms of price and performance, but the customer has the freedom to decide what fidelity they require, what motion capture goal they want to accomplish, and what product best addresses their needs.

www.naturalpoint.com

NaturalPoint co-founder and lead engineer Jim Richardson

Below: The V120:Trio out-of-the-box motion tracking system offers a relatively affordable hardware solution

CREATIVE COMMONS

At Creative Assembly's Horsham base two sizable teams must be kept on track and motivated. Here studio director **Tim Heaton** offers a frank view of his teams' recent history, and gives some sage advice on keeping your studio successful in tough times

Above: Creative Assembly studio director Tim Heaton is proud of the studio's history

It was just before Christmas 2008 that I made my way to Horsham in West Sussex and met the team at Creative Assembly for the first time. The move came from a desire to get back to working more closely with development teams and not just supporting them from the publishing side. I wanted to feel a little bit more directly in control of things, to spend more of my time doing and less time influencing.

Visiting Creative Assembly felt a bit like visiting a grand University, or one of those intimidating City Halls in my treasured Yorkshire. There was a sense of history and of heritage, and a culture that was embedded throughout the fabric of the place, right into the walls; redbrick walls to be fair, not grand gothic arches. What was clear was that quality ran through everything that the teams were trying to do. Not just paying lip service to quality, or polishing quality in at the last stage, but people who think and act with pragmatic quality as their utmost priority at every stage.

A TALE OF TWO TEAMS

So, I leapt at the chance to use my experience from both development studios and big publishers and head the studio up. I set out to inform strategy, to implement some development process ideas I'd had along the way, and to bridge the gaps in both communication and understanding that can so frequently occur between a publisher and a developer.

It's really been a tale of two teams since.

As I started, the *Total War* team were just finishing *Empire*. It had been a huge development and was proving tough to close down and squeeze into a box. A suitably epic game, it was fantastically well received, and has sold tremendously well. It had far too many bugs when it shipped, and the tired team had to drag itself back up and fix them over the next few weeks and months.

The *Total War* team has a huge depth of experience. We gave out some ten-year recognition awards recently, and we were a bit shocked to give out 22 awards. Considering the company size ten years ago, that's just an incredible retention rate, and it's that legacy that feeds into the striving for perfection on *Total War*.

That's not to say *Total War* is a monolithic, tent-pole release game anymore – we're already one of the leaders in downloadable content, working and learning with the team at Steam. We're also looking at new opportunities on all the possible platforms, and already have a team working on a *Total War* game away from PC.

Over the past two years we delivered *Napoleon: Total War* and *Total War: Shogun 2*, and we've been very careful to try and improve on what happened during *Empire*. We handle the scope of the game very carefully, constantly re-assessing it

> ***"It's good to work with external developers, but as a publisher, you don't have control."***

throughout production. In the final stages, we get very wary about locking down features, going through a strict set of milestones. The *Total War* team is big, and we've created functional sub-teams within the overall team organisation to try and spread decision making and responsibility. The devolution of decision making was an interesting process. Communication in a big team is vital, and we have lots of work to do still, but it's a lot of fun working with a team that is so clear in its goals.

QUALITY IS KING

The other side of the studio is the console team. This team delivered *Viking: Battle for Asgard* in 2008, but not all was well. It felt, certainly from the Creative Assembly side, that *Viking*'s quality had been compromised slightly because it slipped, partly due to feature-creep, and understandably Sega weren't happy to give it the extra time. On reading the reviews of the game it certainly felt that people were saying 'there's something really good here, but it's not quite been realised'. Beyond that, the team live in a studio where quality is king, and I think there was a real loss of confidence from some of the key members of the console team.

As I started, the console team was pitching a new IP. In my opinion it was strong and had some really interesting innovation, but in a world where the words 'new IP' send a shiver down any publisher's spine, it just wasn't cohesive enough, and most importantly had entered that netherworld in a publisher where some people were interested, some were confused, and some just didn't like it.

As soon as an idea loses traction in a big organisation with many voices, it's probably dead. So, we killed it. But it was clear the team were extremely talented; they just needed their mojo back. We spent a lot of time studying our figurative navel. Are triple-A console teams not worth the effort? Should we be doing casual games? Should we use these resources for *Total War*?

But from discussions with Sega, it was clear that having a western-based triple-A internal console team would be a valuable asset. It's good to work with external developers, but as a publisher, you don't have control; you often don't have the history that allows trust to be built up, and occasionally there are conflicts in strategy and motivation. Having in-house teams allows you to have a much closer relationship.

A NEW DIRECTION

And then something brilliant happened. Using one of the licences Sega that works with, the team developed an in-house demo in just six weeks. It was a million miles away from *Viking*. We showed it to Sega and they went 'Wow…er…right…hold on', and while it was being discussed, we created yet another demo, for a brand new IP, and that showed yet more of our technical ability and innovative gameplay.

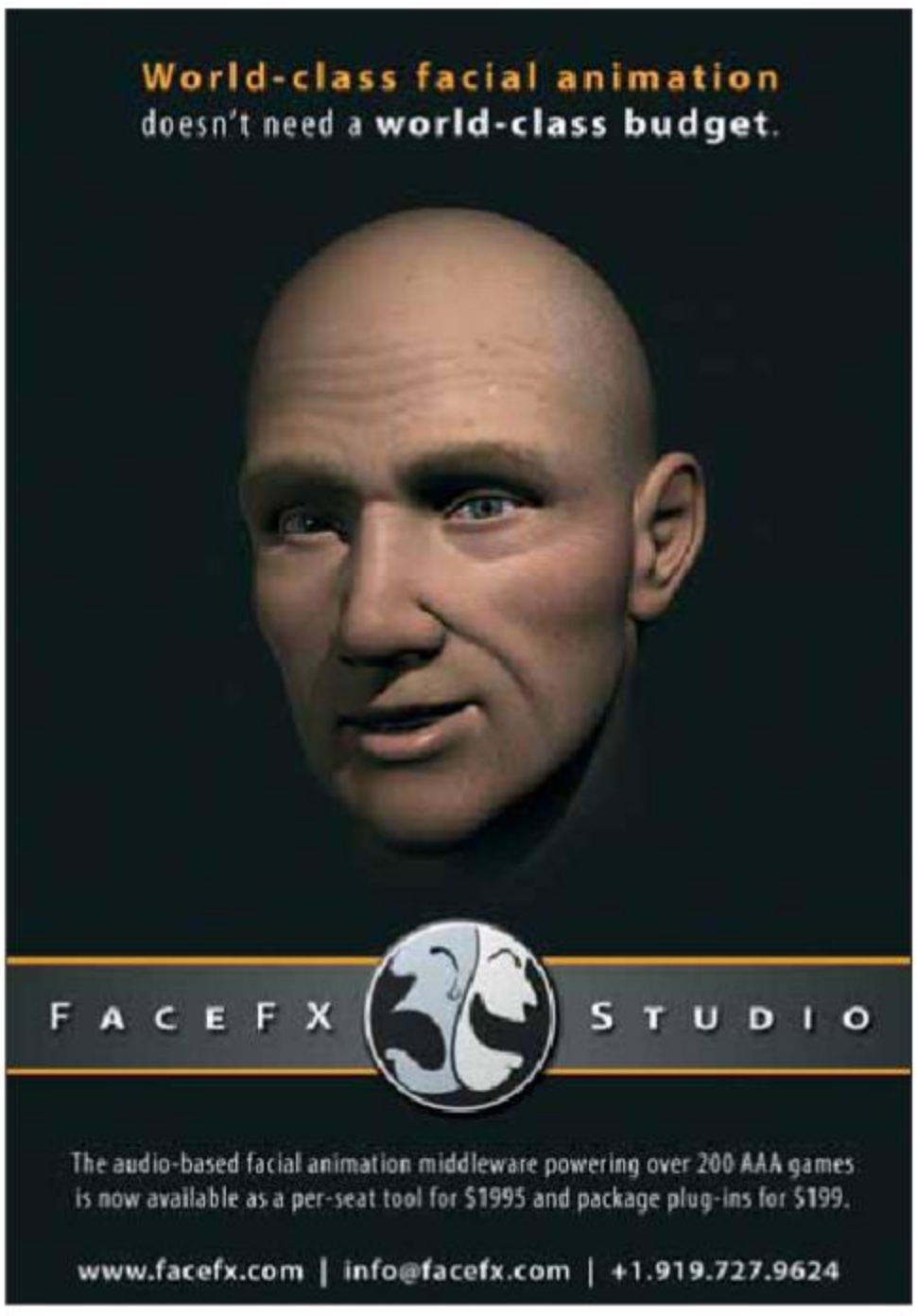
These two demos, totalling about 10 minutes of gameplay in all, were the strongest early playable demos that I have ever seen. They changed absolutely everything. The team were extremely proud, and rightly so.

We felt like we had a direction, and all sides of Sega were excited. That first demo was based on the *Alien* IP, and though we currently can't say any more, we've spent the last year building a hugely experienced team and some bespoke technology to deliver this really exciting game.

So, we continue to grow with Sega's support. This is Creative Assembly's 24th year, and I have no doubt the next 24 will be as tough, perplexing, interesting and fun as the last have been.

www.creative-assembly.co.uk

The Creative Assembly's futuristic Horsham building, above and top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EPIC DIARIES

Mark Rein rounds up what Direct X brings to the table of UE3 users

Samaritian Tech Demo
Developer: Epic
Released: Available to view now
www.unrealengine.com

EPIC RECENTLY presented what we would like to see in the next generation of games with our *Samaritan* real-time Unreal Engine 3 demonstration at the Game Developers Conference in San Francisco.

To take Unreal Engine 3 to the next level, we implemented DirectX 11 support along with NVIDIA's APEX physics technology, and these features were made widely available in the March 2011 release of the Unreal Development Kit (UDK).

Commercial UE3 licensees have source-level access to these additions. Here's a round-up of the DirectX 11 features accessible to anyone who downloads the latest UDK build from www.udk.com.

The Samaritan demo debuted at GDC 2011, and offered a tantilising glimpse into the future of UE3 development

BOKEH DEPTH OF FIELD (DOF)

Real world images captured with a camera lens often depict scenes with some parts more in focus than others. The out of focus objects form shapes, such as circles or pentagons, called Bokeh. Artists can control Bokeh shapes and textures in the UE3 post-processing chain.

Doing DOF as a post process works quite well for opaque objects, as each pixel has a depth associated with it.

Translucent rendering, however, cannot work well with a post-processing method. Ignoring the problem can result in translucent objects that are either too much in focus or too blurry, depending on their background.

We solved the problem by giving control over which translucent objects are affected by DOF within UE3's material settings. Additionally, we've implemented new material node that allows artists to adjust shading by fading objects out or blending them to a blurry state.

TESSELLATION

Because the DirectX 11 tessellation pipeline is programmable, it can be used to solve a large number of graphics problems.

Tessellation works especially well for natural objects with medium-scale details, and UE3's material input enables developers to adjust geometry tessellation on both the edges and the insides of triangles. Tessellation amounts can be controlled by distance from a camera or setup to place more triangles along silhouettes.

A popular refinement algorithm, PN-Triangles, softens the look of coarse models. PN-Triangle tessellation mode smoothes hard edges, converting low-resolution models to curved surfaces, which are redrawn as a mesh of finely tessellated triangles.

UE3 also feature support for crack-free tessellation and displacement.

IMAGE-BASED REFLECTIONS

Image-based reflections are a part of UE3's DirectX 11 rendering pipeline. This technique is used to render real-time whole scene HDR reflections as seen in *Samaritan*. The technique works by reflecting an image that is an approximate version of a scene at each pixel, which makes it more efficient than previous reflection techniques, such as planar reflections.

UE3 enables reflections on any surface with varying glossiness and blurriness. This is useful for visuals such as wet roads where puddles mirror reflections, while other parts of the road appear glossy.

UE3 also supports anisotropic glossiness, where reflections are streaked more in one direction, and dynamic components enable all parts of the reflection except for static shadowing to be changed at runtime. UE3 supports dynamic object shadowing as well.

DEFERRED SHADING

Deferred shading allows dynamic lights to be rendered much more efficiently. Traditional UE3 lighting is called forward shading because the dynamic lighting is calculated while rendering a scene's meshes.

With deferred shading, material properties such as diffuse color are stored in render targets, called G-Buffers, while rendering the meshes in the absence of lighting. Later, in a deferred pass, each light looks up the material properties from the G-Buffers for a given pixel and calculates lighting based on that.

Lights rendered with deferred shading are about 10 times faster than lights rendered with forward lighting. In *Samaritan*, the opening scene had 123 dynamic lights, and all lighting was done using deferred shading except on character skin and hair.

FULL SCENE ANTI-ALIASING

UE3 supports full scene anti-aliasing in DirectX 11 through multisample anti-aliasing. MSAA is a hardware feature that shades pixels only once but evaluates the depth test multiple times per pixel. In UE3, deferred passes like lighting and shadowing work correctly with MSAA by detecting geometry edges and shading per-sample along those edges.

UE3 materials have a feature that multisamples the edges of masked materials. This is especially useful for creating realistic hair and foliage.

Screen-space subsurface scattering: Subsurface scattering refers to light that penetrates the surface of an object, scatters through its interior and exits at a different location. This is why subsurface scattering makes skin appear more luminous.

UE3's subsurface scattering is a screen-space effect that blurs the light incident on the object's surface to other nearby points on the surface. The blur attenuates the lighting based on the world-space distance between the incident and exitant points to model absorption of light by the interior of the object.

For help getting started with these features, visit *http://udn.epicgames.com/Three/DirectX11Rendering.html*

UPCOMING EPIC ATTENDED EVENTS:

E3 Expo Los Angeles, US June 7th to 9th	**Comic-Con** San Diego, US July 21st to 24th
Develop in Brighton Brighton, UK July 19th to 21st	**GDC Europe** Cologne, Germany August 15th to 17th

Please email: ***mrein@epicgames.com*** *for appointments.*

To discuss anything raised in this column or general licensing opportunities for Epic Games' *Unreal* engine, contact: **mrein@epicgames.com**

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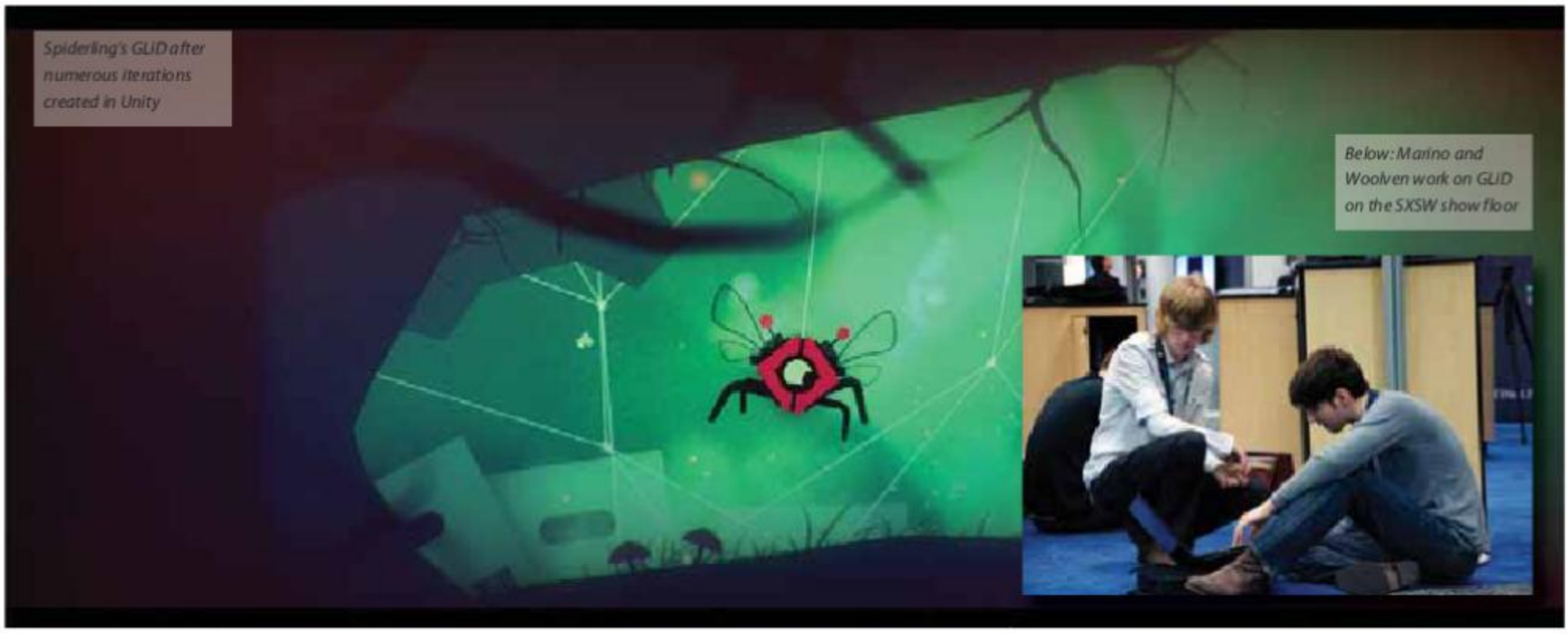
Canadian-born **Mark Rein** is vice president and co-founder of Epic Games based in Cary, North Carolina. Epic's Unreal Engine 3 has won *Game Developer* magazine's Best Engine Front Line Award four times along with entry into the Hall of Fame. UE3 has won three consecutive Develop Industry Excellence Awards. Epic is the creator of mega-hit "Unreal" series of games and the blockbuster *Gears of War* franchise. Follow @MarkRein on Twitter.

UNITY FOCUS

Will Freeman meets a duo of young Unity users becoming a great success

GLiD
Developer: Spiderling
Platform: PC
What is it: A puzzle platformer with an arachnoid lead
www.glid.co.uk



Spiderling's GLiD after numerous iterations created in Unity

Below: Marino and Woolven work on GLiD on the SXSW show floor

WHEN MARCO Marino and Matt Woolven took time away from university to focus their energy on their microstudio Spiderling, they reasoned that, as they both wanted to work in the games industry, it "couldn't hurt" to see how far their ambition would take them.

The move demonstrated admirable devotion, and it paid off. By the time Spiderling took its game *GLiD* to SXSW it was impressive enough to win the Grand Prize at the 2011 ScreenBurn Independent Propeller Awards, bagging the team a $50,000 boost to their development budget.

UNITY SAYS RELAX

Back when *GLiD*, which is pitched as an 'ambient exploration game', was just an idea in the collective conscience of Marino and Woolven, the pair were actually using the Blender engine, which offered fine prototyping functionality, but left the team longing for far more beyond that.

"One day over the summer, we noticed Unity was free and gave it a download, and it was love at first sight," says Marino. "It also works excellently alongside Blender, we could use it to model everything, which was perfect. In the first couple of weeks with Unity, we decided to make as many tiny projects as we could in order to learn the ropes, and one of those tests was a small red cube with wheels and a big eye in the middle that later became *GLiD*."

With both the team members having gained far more experience in artistic endeavours than technical proficiency, as *GLiD* started to evolve into a more serious project they were faced with the somewhat daunting challenge; mastering the programming and coding elements which were relatively alien to them.

"We find drawing easier than coding," admits Marino. "As a result we have dreadfully short attention spans, so being able to hit the big 'Play' button at the top is definitely our favourite Unity feature. It gives a lot of freedom to experiment and evaluate the results instantly."

The Spiderling founders also found Unity was particularly suited to their rather spontaneous creative approach, which sees them toy with a multitude of ideas with little planning, adopting a ferocious 'trial and error' method.

"If it wasn't so easy to get from the initial idea to seeing it working in game we would have made something very different," states Marino. "We were also amazed with the Unity interface; everything made sense and was in just the place you would expect. After only a couple of days using it we were both very comfortable with it. It was just a case of getting better at coding, which happened very naturally."

> ***"Unity works excellently alongside Blender, we could use it to model everything, which was perfect."***
>
> Marco Marino, Spiderling

DRAWN TO LIFE

Unity also played a substantial role in shaping the look and feel of *GLiD*, which lets players assume control of an agile arachnid robot. Treating the tech as a virtual sketchpad topped with a Play button, Marino and Woolven were able design much of the game's stylistic direction in-engine.

"Originally a lot of the environment was made directly in Unity, although later on when things became more intricate we would simply take a screen shot from inside Unity and scribble over it in Gimp on a new layer, and then import the layers back in to Unity to see how it looked in motion," explains Marino. "This quick back and forth between Unity and Gimp is how we arrived at the look of the game now."

The end result is a highly distinct indie game that has already wowed judging panels and professionals the world over, and looks set to find favour with the public when it finally sees release later this year.

Lifting the GLiD

GLiD is an 'ambient exploration game'. If you're unsure what exactly that is, you wouldn't be the first to find yourself in that position.

When the duo that make up studio Spiderling – Marco Marino and Matt Woolven – started to develop the game, they were only following a loose sense of what the game was. Fortunately, today the team has a far more concrete sense of what platformer *GLiD* offers.

"The aim is to make sure the player never feels pressured into action; we want you to take your time looking around and be rewarded for it," says Marino. "That's not to say it won't be challenging though, using your web to solve puzzles is a large part of the game, it's a mechanic we haven't seen before and hopefully people will enjoy playing around with it and finding out what can be done."

Happily for the Spiderling boys, who moved away from university to work on their game, hopes look set to be fulfilled. In fact, things are going so well with the as of yet unreleased game that they look unlikely to return in the near future.

HEARD ABOUT

John Broomhall talks to Brink's audio director, Chris Sweetman

BRINK
Developer/Publisher: Splash Damage/Bethesda
Release Date: Out now
Platform: PC, PS3, Xbox 360
www.brinkthegame.com

FOR GAME audio veteran Chris Sweetman, Splash Damage's *Brink* has been a three year labour of love.

Collaborating with in-house audio programmer Simon Price, he has procured the outsourcing talents of Bob & Barn, Charles Maynes, Shepperton Studios and Malin Arvidsson in a production team approach that reflects the film industry method. Certainly though, he has been ever conscious that the buck has to stop at his mixing desk.

Brink builds on previous releases *Wolfenstein: Enemy Territory* and *Enemy Territory: Quake Wars*. However, the newly created IP boasts what Sweetman coins 'mingle-player' where singleplayer, co-op and multiplayer modes all co-exist in one seamless experience. Your friends can drop in and out at will to either oppose you or to play alongside you.

A SENSE OF ID

The starting point for the audio was technology, as Sweetman explains: "We were using id tech from id software which has its own sound engine but we rebuilt a lot of it to create an HDR-style mixing system. Having automated mixing behaviours takes away a lot of the heartache and work but we also have a snapshot system so we can say, 'Okay, this isn't realistic, but at this moment I'm going override the HDR to prioritise these particular sound groups for dramatic effect."

As for weapons, Sweetman brought useful experience of a trusted granular approach to the project: "Instead of using single-shot or loop-based models, we break every individual shot into a grain with playback comprised of starts, middles and ends. The middles play randomly in any order, and not being locked to frame rate means no problem with retaining the mistimings inherent in gun recordings – automatic weapons simply just don't fire at exactly the same rate every clip and the mistimings provide character."

Unsurprisingly, weapons represented a serious time and money commitment with Charles Maynes hired to conduct a bespoke field recording session in the desert just outside Las Vegas.

"The lead writer and I concocted a list of hardware to play with. My criteria was distinctiveness of sound – *Brink's* weapons aren't based in reality so as long as the gun proposed had some unique audio quality, it could make my list – I was collecting sonic building blocks."

> ***My criteria was distinctiveness of sound – Brink's weapons could make my list – I was collecting sonic building blocks.***
>
> Chris Sweetman

The shooting sounds were captured on linked 744ts at three distances – close-up for all the mechanical detail, mid-range approximately ten feet away, and also at an undisclosed more distant point. Later, Sweetman imported the recordings to ProTools for many hours' editing and organising into logical groups - automatics, single shot weapons, shotguns and pistols (plus many 'silenced' versions). He then navigated the some 70GB of material, constructing and compositing to make the actual in-game material, also creating sounds for the various gun customisations available to the player – muzzle breaks, iron sights and so on. Of the total 8,500 sounds in the game, approximately 4,700 are for weapons.

CATCHING FIRE

"For iron sights we did a 'zero perspective' effect," says Sweetman. "In many titles, guns sound identical whether staring down a sight or shooting from the hip. In *Brink*, when you're sniping and zoomed in, we bring down the volume and EQ the usual sound slightly – then add an extra mechanical layer. The visual perspective is changed so why not the audio? We're not aiming for realism – more a case of aural excitement."

Additionally, the same guns will sound different dependent on whether you're playing as the security forces or the resistance. In the case of the former, weapons sound slick compared with the impression given of a more ill-maintained resistance armoury. Add distance clues provided by subtle use of the three mic placements and 5.1, and Sweetman feels the audio serves the gameplay, helping the player identify the spatial position of other players, whether they're hostile or friendly and their weapon type. This demarcation extends to the music experience, each group having their own themes and musical motifs recorded by Bob & Barn with the Prague Philharmonia.

The audio recognition factor is further enhanced by an extremely detailed approach to foley.

"We really went to town on this stuff," Sweetman says.

"For instance, each character has 270 footsteps and there are three weight classifications – so you have your light guy who can do all the smart movements, almost parkour-style. If you're wearing less clothes you sound different. Again it's a granular approach, so add a gun belt and you'll can hear the change."

The recordings were made with Glen Gathard at Shepperton over three days. Sweetman believes this audio detail firmly grounds the player in the world. Along with bespoke ambient sounds, foley vividly brings the game world to life.

"On the one hand I'm a perfectionist so I'm never happy," Sweetman concludes. "On the other, I am proud of *Brink* – it was a great team. And I'm really looking forward to what we're doing in future at Splash Damage."

Above: Brink audio director Chris Sweetman

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Deferred Shading

This excerpt from Game Engine Gems 2 offers the first of a two-part guide to deferred shading co-written by **Balor Knight**, **Matthew Ritchie** and **George Parrish** of Black Rock Studio

Game Engine Games 2's editor Eric Lengyel (top), and the excerpt's co-authors and Black Rock Studio team members (top to bottom) George Parrish, Matthew Ritchie and Balor Knight

DEFERRED SHADING is an increasingly popular technique used in video game rendering.

Geometry components such as depth, normal, material colour, etcetera are rendered into a geometry buffer (commonly referred to as a G-buffer), and then deferred passes are applied in screen space using the G-buffer components as inputs.

A particularly common and beneficial use of deferred shading is for faster lighting. By detaching lighting from scene rendering, lights no longer affect scene complexity, shader complexity, batch count, etcetera. Another significant benefit of deferred lighting is that only relevant and visible pixels are lit by each light, leading to less pixel overdraw and better performance.

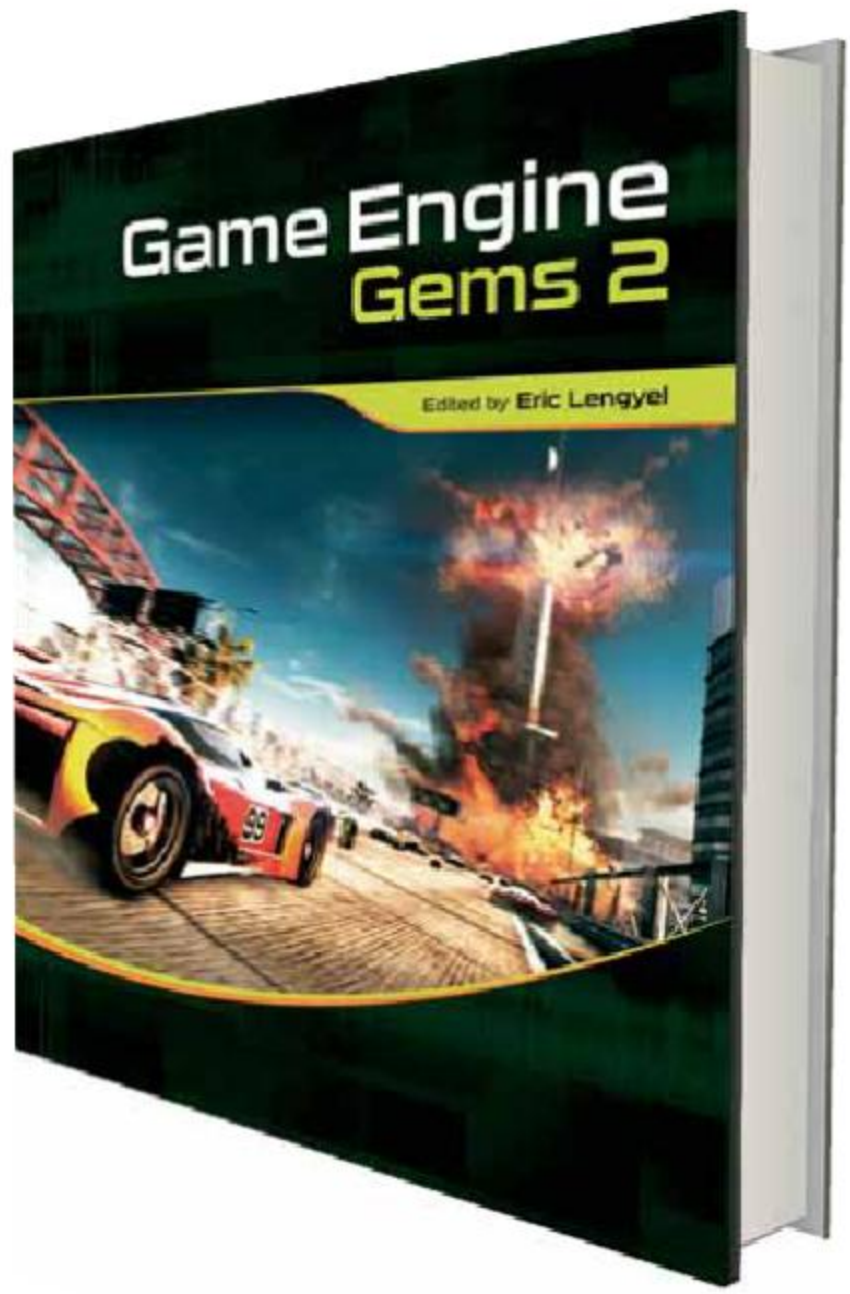
The traditional deferred lighting model usually includes a fullscreen lighting pass where global light properties, such as sun light and sun shadows, are applied.

However, this lighting pass can be very expensive due to the number of onscreen pixels and the complexity of the lighting shader required.

A more efficient approach would be to take different shader paths for different parts of the scene according to which lighting calculations are actually required. A good example is the expensive filtering techniques needed for soft shadow edges. It would improve performance significantly if we only performed this filter on the areas of the screen that we know are at the edges of shadows.

Swoboda [2009] describes a technique that uses the PlayStation 3 SPUs to analyse the depth buffer and classify screen areas for improved performance in post-processing effects, such as depth of field. Moore and Jefferies [2009] describe a technique that uses low-resolution screen-space shadow masks to classify screen areas as in shadow, not in shadow, or on the shadow edge for improved soft shadow rendering performance. They also describe a fast multisample anti-aliasing (MSAA) edge detection technique that improves deferred lighting performance.

These works provided the background and inspiration for this chapter, which extends things further by classifying screen areas according to the global light properties they require, thus minimising shader complexity for each area. This work has been successfully implemented with good results in *Split/Second*, a game developed by Disney's Black Rock Studio. It is this implementation that we cover in this chapter because it gives a practical real-world example.



OVERVIEW OF METHOD

The screen is divided into 4x4 pixel tiles. For every frame, each tile is classified according to the minimum global light properties it requires. The seven global light properties used on *Split/Second* are the following:

1. Sky. These are the fastest pixels because they don't require any lighting calculations at all. The sky colour is simply copied directly from the G-buffer.
2. Sunlight. Pixels facing the sun require sun and specular lighting calculations (unless they're fully in shadow).
3. Solid shadow. Pixels fully in shadow don't require any shadow or sun light calculations.
4. Soft shadow. Pixels at the edge of shadows require expensive eight-tap percentage closer filtering (PCF) unless they face away from the sun.
5. Shadow fade. Pixels near the end of the dynamic shadow draw distance fade from full shadow to no shadow to avoid pops as geometry moves out of the shadow range.
6. Light scattering. All but the nearest pixels have a light scattering calculation applied.
7. Antialiasing. Pixels at the edges of polygons require lighting calculations for both 2X MSAA fragments.

CALCULATING LIGHT PROPERTIES

We calculate which light properties are required for each 4x4 pixel tile and store the result in a 7-bit classification ID. Some of these properties are mutually exclusive for a single pixel, such as sky and sunlight, but they can exist together when properties are combined into 4x4 pixel tiles.

Once we've generated a classification ID for every tile, we then create an index buffer for each ID that points to the tiles with that ID and render it using a shader with the minimum lighting code required for those light properties.

We found that a 4x4 tile size gave the best balance between classification computation time and shader complexity, leading to best overall performance. Smaller tiles meant spending too much time classifying the tiles, and larger tiles meant more lighting properties affecting each tile, leading to more complex shaders. A size of 4x4 pixels also conveniently matches the resolution of our existing screen-space shadow mask [Moore and Jefferies 2009], which simplifies the classification code, as explained later. For *Split/Second*, the use of 4x4 tiles adds up to 57,600 tiles at a resolution of 1280x720.

Check back with Develop next month for the final part of this two-part tutorial.

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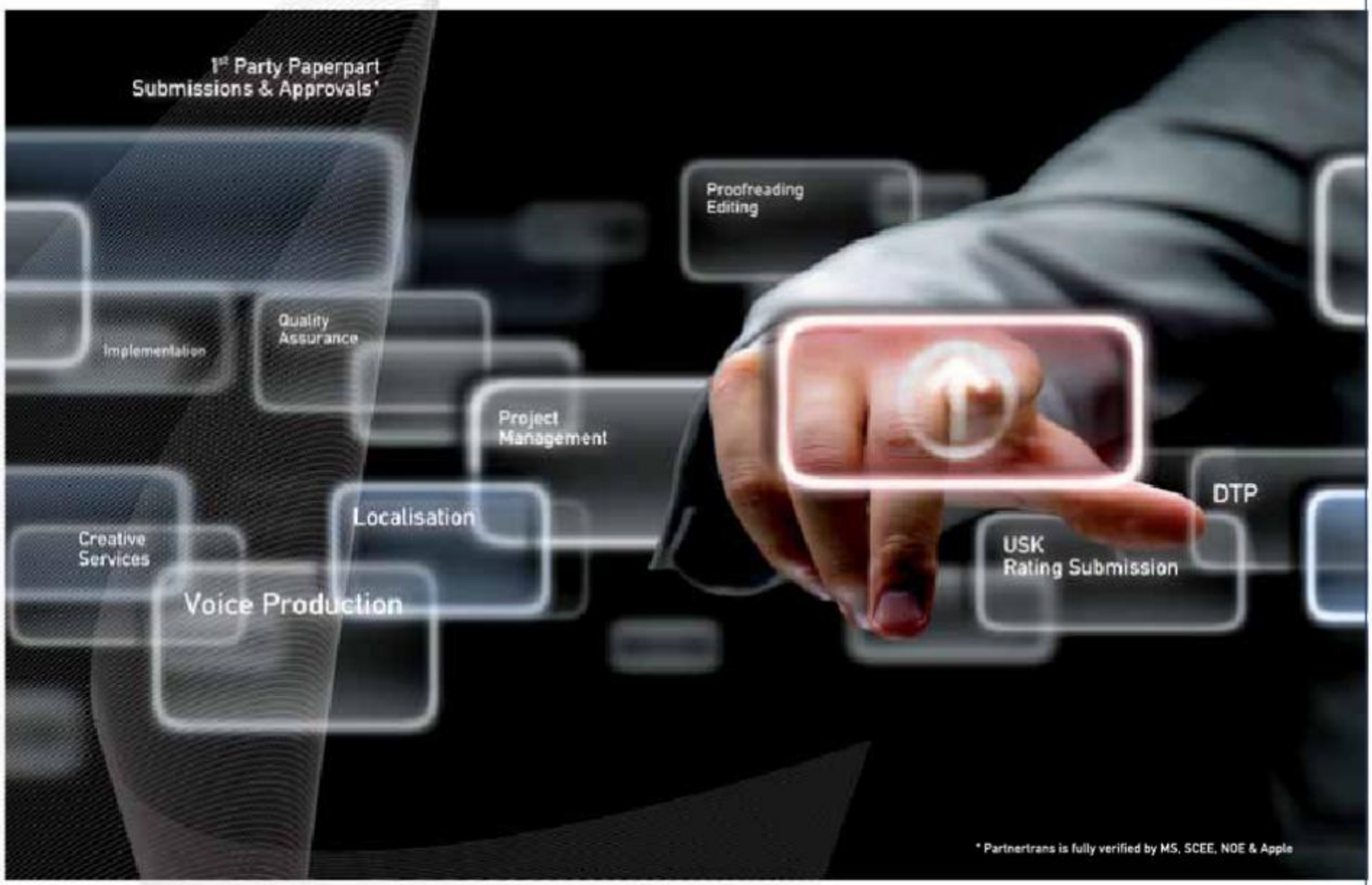

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DEAD END THRILLS

In the latest in his series, **Duncan Harris** takes a look at Star Trek Online

STAR TREK ONLINE

WHATEVER ITS gymnastic fiction might tell you, *Star Trek* has occupied many universes over the years, all of which sit side-by-side, one-atop-the-other in *Star Trek Online*. To say this looks awkward would be something of an understatement. It is, however, a working solution to a difficult problem. Touring Federation space and beyond in their own personal – but not private – bubble, each *STO* player is left to build their own tribute to the show out of one or more of its generations, dozens of micropayment items and a handful of customisation options. And it doesn't stop there.

The needs of the MMO peck at the series' continuity – superficial as it always was – with every improper uniform, unscientific ship configuration and blasphemous colour clash. Few of its scenarios embrace real world current affairs or even teatime soap opera, leaving an awful lot to the imagination and even more to the poor souls at developer Cryptic. Just as well, then, that mission authoring tool The Foundry has placed much in the hands of its players.

In a game of often smart, often necessary compromises, the sharpest is the use of two distinct art styles for character and ship-based action. The characters are fantastical – some would say 'cartoony'; the ships are real, lit with arguably greater attention to detail than any uniform or prosthetic forehead.

Tools and tricks for this screenshot: Cryptic demo recorder, timestop, free camera.
www.deadendthrills.com

Dead End Thrills is a website and resource dedicated to the art of video games. It believes this art is too easily overlooked thanks to factors including technology, design and the 'fast food culture' of modern play. Its Twitter feed presents works and curiosities from gaming's vast art community, with occasional stories about cats.

Developer: Cryptic Studios
Publisher: Atari
Released: 2010
Capture format: PC

Magic Moments

Considered concept art can be the making of a good game. **Ron Ashtiani**, director at art company Atomhawk knows a thing or two about getting it right, and here takes a look at the importance of 'key moment' artwork

'Key moment' concept art (left and below) can serve as a reference point for both the design and programming teams

Ron Ashtian, director at conceptual design and digital art production company Atomhawk

IT HAS been quite some time since I've written anything for the gaming press, having been 'nose to the grindstone' since my career shifted two years ago from internal art director – until Midway closed in 2009 – to being an external art services specialist when I founded Atomhawk Design shortly after.

I sometimes look back on my decision to move out of being at the core of a game development studio and into what some might consider the slightly less sexy world of outsourcing as I very much love being involved in the full cycle of making games.

To be honest though, I never really saw a move into pure concept art and design as a step away from my love of making games; more a change that enabled me to focus on the creative.

I've worked with over 20 development studios in two years, some of which have great creative processes and also some that don't. I've spent a lot of time advising studios on how to make better artwork and decisions. However every studio has their own needs and methods, and that is one of the things I love about this diverse and creative industry.

MOMENTS OF TRUTH

I've always been a big evangelist of conceptual design, and I believe in not only designing tangible game aspects like the art style, environments and characters, but also in the more woolly parts like key story and action moments. Things like taking the time to think about how the player will feel and what they will see as they witness a certain moment in the game. We call this a 'key moment' image.

In my earlier years of game development from the late '90s on, I often found that concept art mainly took the form of instructional sketches, intended as reference in the building of 3D models. This fairly limited use of the concept process is still seen in many development studios today.

Often characters, props and locations are designed in isolation. The first time the designs would all be seen on screen together, side by side, is when the game designers would use the 3D models to put together a scenario in game. Designers were often limited by what assets were available in the parts bin. Sometimes these game scenarios get an art pass afterwards to improve quality but the overall result is often that the scene is creatively constrained.

> ***"One of the biggest issues in game development is artists and designers not being able to communicate the features they need to programmers."***

What we have seen in the last few years is the leading studios focus on crafting an experience for the player; much like in movie production, where each scene is storyboarded, each set and lighting scheme is designed to work with the angles it will be viewed at.

UNDER PRESSURE

The pressure on art directors is well and truly on, as they need to think about the game narrative much like a movie director, cinematographer and editor. Some of the bigger studios have imported those very skills in from film.

The idea of key moment concept art has very much been born out of this evolution. The art team will often storyboard an action sequence and then explore key shots in polished colour images. These images capture not only the structural detail of the scene, but also the mood and action, which are often driven by lighting, composition and the pace of the scene. All this extra work doesn't come cheap, but a number of other benefits justify the cost.

No matter how clear your vision is, a verbal explanation is often open to interpretation. In my view, one of the biggest issues in game development is artists and designers not being able to communicate the features they need to programmers, and also programmers not being able to tell the art team what the end result of a feature will look like until it is done. Producing a key moment image immediately brings everyone together around a reference point for discussion.

Key moments also double up as great marketing artwork, especially when the game engine is still a work in progress and the game looks like a virtual building site. You can keep your publisher/marketing team at bay for at least a few months with good artwork.

As the industry consolidates, the stakes are getting higher all the time. Graphics hardware and technology used to be the battle frontier between game developers, but now it is the creative content. I believe that where studios used to invest in their own technology, they now need to invest in their creative thinking to stay ahead of the competition.

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SEEING THE NOISE

Lightning Fish's senior programmer and the original MAME creator **Nicola Salmoria** offers an in depth insight into getting the most from tracking cameras like those found in Kinect

With the recent introduction of Kinect for the Xbox 360 the industry has seen something of a surge of interest in the field of camera based player tracking. To this end, Kinect comes pre-loaded with an impressive array of aids like traditional RGB, infra-red depth and microphone sensors.

There really is an impressively large amount that can be achieved with the basic RGB cameras, including the fact that you can use it to enhance the depth camera information on Kinect.

This article aims to show you how to get the best results, by giving you an understanding of RGB camera noise and where it comes from.

If, for example, you want to separate out the moving objects in a scene (such as the players), a good place to start is with a per pixel image of the non-moving background. The moving objects – or foreground – are then the pixels in the scene which don't match your model of the background. However, camera noise means that even pixels which are in the static background can appear to change.

The better your estimate of the noise is, the more useful your background model will be (*see Figure 1*).

UNDERSTANDING CAMERAS

There are several different stages within the process which converts the light in a scene into a camera image. First, light passes through the lens and is converted to electrical charges.

This signal is then amplified, sampled by an analogue-to-digital converter, and processed in the digital domain to apply white balance and gamma corrections.

The sensor also needs to separate the red, green and blue colour channels. In almost all modern consumer cameras this is done using something called the Bayer Filter Mosaic (*see Figure 2*).

A colour filter is placed over the camera sensor, so that each photosensor receives light of only one of the three primary colours, in a repeating pattern. 50 per cent of the photosensors receive green light, 25 per cent red and 25 per cent blue.

The final colour image is produced in software by an algorithm called demosaicing, which derives the missing colour components of each pixel from the neighbouring pixels. So you could say that the effective resolution of a three megapixel camera is really only one megapixel.

For vision processing algorithms, demosaicing isn't a good thing. It increases the amount of data to process without introducing any new information, and may actually degrade the original data, depending on the type of interpolation used.

> ***A lot can be achieved with basic RGB cameras, and you can also use it to enhance the depth camera information on Kinect.***

Fortunately, the raw Bayer image produced by the camera is often accessible. In this case, it's certainly worth using the raw image directly, since you will get more accurate results and use less processing power. The one thing that you need to keep in mind is that the raw Bayer image isn't a real grayscale image; it's a filtered image, so you need to be aware of which filter colour corresponds to each pixel.

UNDERSTANDING NOISE

Whether you happen to be using either the raw Bayer data or the processed output from a camera driver, your image will invariably contain some random noise. Even if the scene which the camera saw was a perfectly static one, and the camera was completely accurate, the number of photons hitting the sensor would vary from one image to the next (This effect is known as photon shot noise in quantum physics). The camera circuitry will also add a fair amount of noise of its own.

If you are identifying moving foreground by comparing the camera input to a static background image, a good way of dealing with noise is to specify a threshold which quantifies how much the values of pixels can vary from those of the corresponding pixels in the background before they are categorised as foreground.

This prevents you from automatically identifying 'noisy' pixels in the background area of the image as foreground.

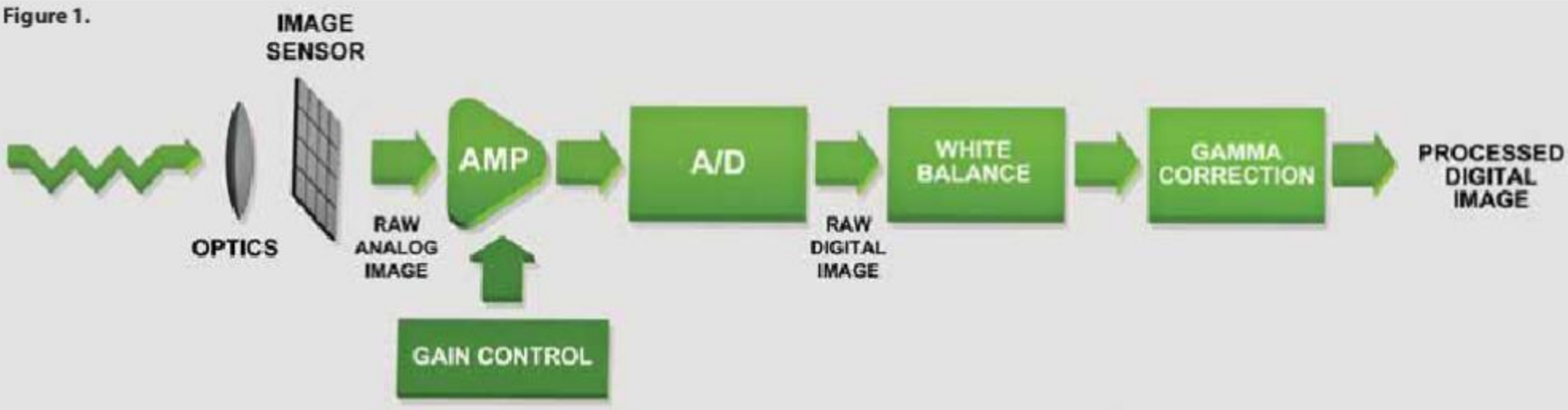
To get the best results, the threshold should depend on the actual level of noise. A theorem in probability theory, called Chebyshev's inequality, can be used to pick a suitable value. This theorem guarantees that in any data sample, no more than 1/k2 of the samples can be more than k standard deviations away from the mean. For example, no more than 1/9th of the true background pixels can be further than three standard deviations from the background model. So if you know the standard deviation of the noise, you can set the threshold to the number of standard deviations which corresponds to the error rate – the number of true background pixels which will be wrongly classified as foreground – you're happy with.

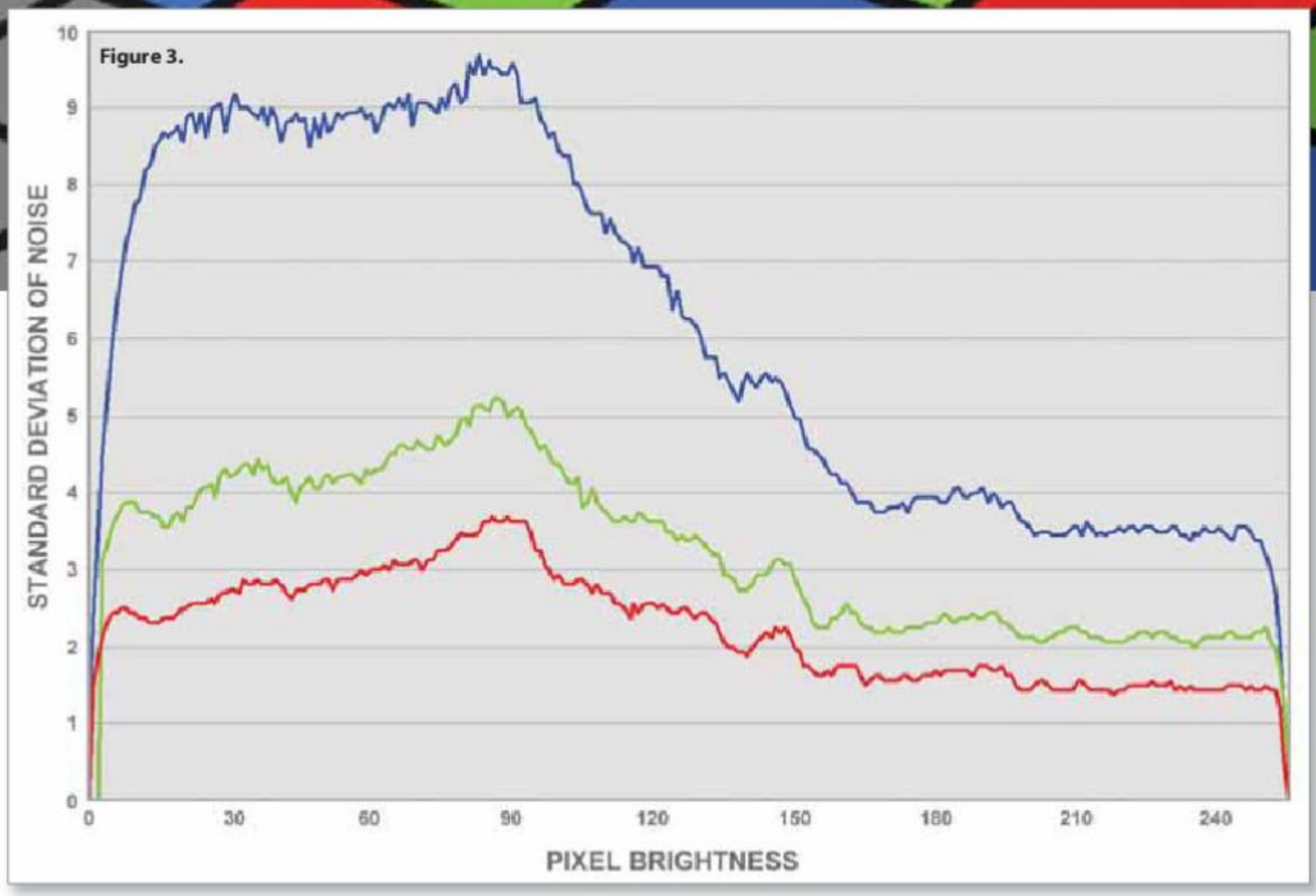
If you use a very high error rate, background pixels which are not very noisy compared to the current level of noise in the scene will be classified as foreground. Similarly, if you use a very low rate, pixels which are actually foreground will often be categorised as background. The best choice of error rate will be somewhere in the middle.

To use this approach, you need to estimate the standard deviation of the camera noise. The first thing to do is lock the gain, white balance and exposure settings on the camera, since variations in these will cause the noise level to change.

You might expect that the next step is to find a noise level for the camera image as a

Figure 1.





Right: An example of how noise changes depending on the colour channel and pixel brightness

whole. This isn't the best solution, however, since noise varies across the image, and in particular noise depends on pixel brightness. The most important reasons for this are:

- Photon shot noise is proportional to the square root of the number of photons hitting the sensor
- Gamma correction in the camera enhances dark pixels, which increases their 'noisiness'

That means you need to determine the camera noise independently for each of the possible brightness values. You also want to be able to do this robustly regardless of what happens in the scene, because you can't expect the camera image to be perfectly static. Remarkably, this can be done in a few simple steps.

Record the mean and variance of the brightness for every pixel in the camera image over a few frames.

Next, calculate the median of the recorded variance for each of the 256 levels of each individual colour channel. The median is used because it is less affected by occasional outlying values than the mean. This gives an estimate for the noise variance at that brightness. The standard deviation is just the square root of the variance.

Repeat the previous steps, replacing the previous estimates only when the new estimates are lower. This ensures that when the initial noise estimates are too high because there was a lot of movement in the scene, or if estimates weren't available at all because there were no pixels of that brightness in the scene, better estimates will be adopted as soon as they become available.

> ***"When you have a good model of the noise, you can use that model to get more stable and accurate results from your vision system."***

The algorithm described above must be applied to each of the three colour channels independently, because the white balance settings on the camera will typically cause it to amplify each channel – and its corresponding noise – differently.

If you have the raw Bayer image, each pixel has a single colour so you don't have to worry about anything else.

If you are using the RGB image, however, things are made significantly more complicated again. The de-mosaicing algorithm interpolates the values of neighbouring pixels, and does so in a way which depends on the filter colour.

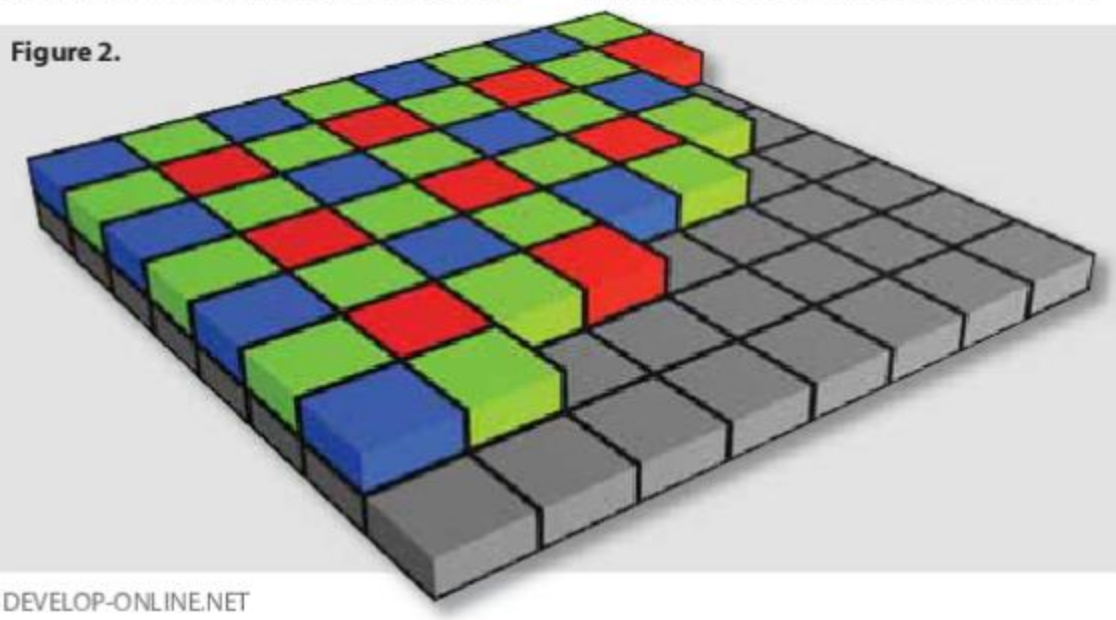
Since the type of interpolation will affect the 'noisiness' of the pixels, you must look not only at the colour channel but also at the filter colour. So you will need a total of nine groups, one for each possible combination of colour channel and colour filter (*see Figure 3*).

Tracking players reliably with a traditional RGB camera is difficult, but it can be done. You can also use these techniques to enhance the depth information using the RGB camera on the Kinect.

The first step in building a system which can achieve this is to understand the camera you're using, and the sources of the noise in its output. Once you understand the noise, you can model it. When you have a good model of the noise, you can use that model to get more stable and accurate results from your vision system, no matter what algorithms you use to follow the moving objects in the scene.

www.lightningfishgames.com

Figure 2.



Nicola Salmoria is a senior programmer for Lightning Fish, working on its engine technology, including vision processing. Salmoria was also the creator of the arcade game emulator MAME. Most recently he has been working on *Let's Dance*.

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PERSONNEL

This month: GamersFirst, Wonderland Software, Playground Games and Valve Software

Dave Jones has been appointed as an advisor of the *All Points Bulletin* remake, months after his previous employer Realtime Worlds collapsed following the release of the original game.

The widely respected Jones has taken advisory role on the **GamersFirst** board, which is publishing a free-to-play remake of the game. Last year, Realtime Worlds buckled under severe financial strain, following 'lacklustre' sales of its exorbitant *APB* project. Over 200 jobs were lost, though GamersFirst bought the *APB* IP.

Jones said he was excited to be fulfilling his long-term vision for the game with GamersFirst. "This game was my passion back when I was developing it with Realtime Worlds," he said.

www.gamersfirst.com

Social giant Zynga has made its first acquisition of a UK development studio.

Wonderland Software, creator of iPhone title *GodFinger*, is to be renamed Zynga Mobile UK. Its staff will now be working for Zynga, while the studio's former CEO – Matthew Wiggins – takes the role of general manager.

"Wonderland is composed of an amazingly talented, creative team, known for developing deeply engaging and innovative games," said David Ko, senior vice president of mobile at Zynga.

"This is a team that has developed novel game technology to tell engrossing stories and I'm incredibly excited to have Wonderland join Zynga as we build a presence in the UK."

www.zynga.com

Five new developers have joined Leamington Spa, UK-based studio **Playground Games**. The studio is continuing to hire to fill 50 positions that have opened up as part of development on an as yet unanaounced triple-A title.

Anthony Filice and Chris Downey join from recently closed Bizarre Creations as art director and lead environment artist repectively. Their previous credits include work on the *Project Gotham Racing* series, *Blur* and *James Bond: Bloodstone*.

Matt Osbond comes to Playground from Rare as a senior technical artist, while Karl Hammarling and Paul Penson have joined from Codemasters, where they served as a lead gameplay engineer and lead UI engineer respectively.

www.playground-games.com

A trio of game developers have joined **Valve Software** in Washington.

Michael Abrash, Scott Ludwig and Mike Sartain have each signed contracts to work at the developer, following years of exhaustive headhunting.

Michael Abrash is a distinguished programmer who contributed to Id Software's ground-breaking *Doom* project in the early nineties, and went on to create technology for *Quake*.

Scott Ludwig is not a familiar name in game development circles but Newell was unrelenting in his praise of the senior software engineer.

Mike Sartain, meanwhile, was a key contributor on the original *Halo* project at Bungie.

www.valvesoftware.com

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STUDIO SPOTLIGHT

This month: Monumental Games

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Back in 2005, Rik Alexander and Rocco Loscalzo founded indie UK studio **Monumental Games** following the closure of Nottingham outfit Climax. The new company established itself in the same city, and throughout the ensuing years has developed titles in a licensed thrid party capacity for the likes of fellow UK firm Codemasters, London-based Eidos and umberella firm Kuju Entertainment. The studio has also worked with the likes of Microsoft Windows on technology and development projects.

Along with this collaboartive work, the Monumental Technology Suite toolset and the 3D MMO Prime engine have been licenced out to an international community of, as Monumental has it, more than 50 studios.

Monumental Online keeps the technology suite up-to-date and relevant, and also develops and maintains the popular *Hunter's World* and *Football Superstars* MMO franchises, developed as in-studio IP and for publisher Cyber Sports respectively.

Monumental Racing, the separate in-company studio responsible for the automotive game work of the company, is also the development hub of its core racing technology. It was the creator of the recent, well-received *Capcom MotoGP* licenses 09/10 and 10/11, and shares its tools and experience with other studios creating racing titles.

Monumental Conversion and Emerging Technologies is a new studio department dedicated to creating applications for gaming innovations, and currently involved in a number of undisclosed projects.

In early 2011 *Little Horrors*, a 3D Facebook title and the latest venture from Monumental, came into being. Representing a bold move into the casual gaming sector for the studio, it encapsulates both the shifting focus of UK games development and the adaptability of the company behind it. It will likely retain a position at the fore of national and international developent as its efforts expand to meet the growing scope of modern games development.

www.monumentalgames.com

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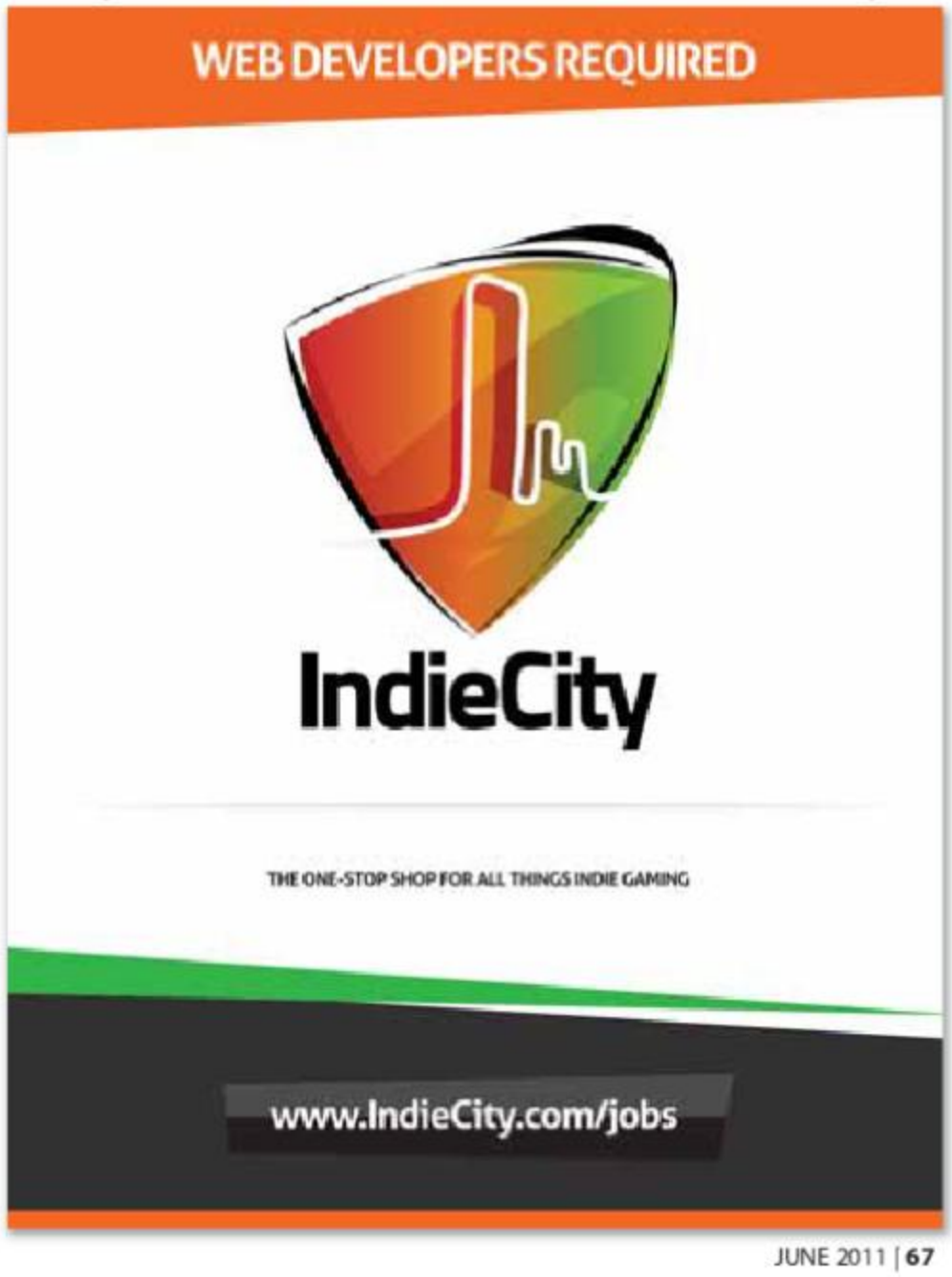

TOOLS NEWS

This month: Hansoft and CryEngine 3

The latest version of **Hansoft's** project organisation tool has been released.

The eponymous Swedish firm says version 6.6 will feature enhanced collaborative reporting processes. These will allow customers to share data better.

That means the Hansoft tool is now better suited to companies that outsource their work. Localisation tools for Japanese and Chinese developers have also been made available.

Tokyo-based Kojima Productions is a recent licensee of the tech.

Yuji Korekado, production manager at Kojima Productions, said the firm started using Hansoft just within a select group of managers.

"However, once we experienced Hansoft's fast and intuitive interface, powerful find and report tools, and host of other useful features, it didn't take long before we brought the entire studio onboard," confirmed Korekado.

www.hansoft.se

A free edition of **CryEngine 3** will be made available in August, vendor Crytek has announced.

The Frankfurt-based studio said the new SDK will be free to download for non-commercial purposes.

CryEngine 3 is the high-end multi-platform game engine that powered the FPS blockbuster *Crysis 2*. In making it free to play with, Crytek is following the path of rival engine firms Unity and Epic Games.

Company CEO Cevat Yerli said the new SDK would reignite the modding community. In an open letter to his fans, he admitted that Crytek recently had few resources to support this area of its business: "In recent times our focus has been heavily on the development of Crysis 2, however our modding community has been, and remains, very important to us."

"In August 2011 we will be launching a free CryEngine SDK."

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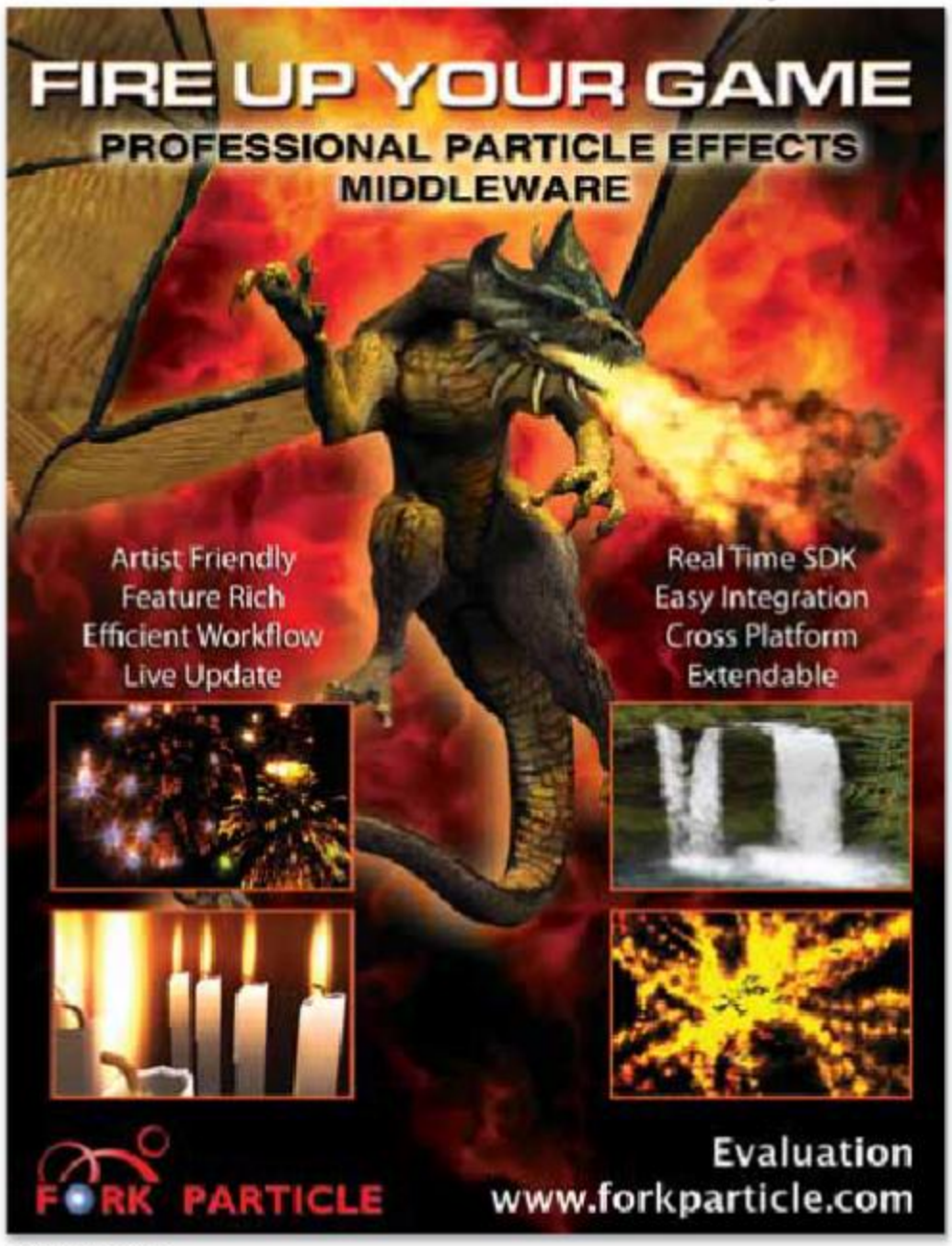

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SERVICES NEWS

This month: Side, Periscope Studio, Trickstar Games and Gaikai

London production house **Side** has revealed its involvement on *The Witcher 2* project. Side cast and recorded 40 actors delivering over 20,000 lines of dialogue for the second instalment in the RPG saga.

"You're not going to hear any big name actors when playing the English version of *The Witcher 2*," said the game's senior writer Borys Pugacz-Muraszkiewicz.

"You will, however, hear a broad range of convincing characterisations and accents, and natural, believable, emotionally committed performances adorned with just the right amount of flair and panache. That we owe to the roster of talent Side placed at our disposal."

Work on *The Witcher 2* adds to a long string of projects Side has been involved in, from *Brink* to *LittleBigPlanet*.

www.side.com

Hamburg audio company **Periscope Studio** has opened a new Core Soundtrack team to increase its focus on triple-A projects. Periscope's head of creation Finn Seliger heads up the new team.

"While maintaining high-quality for all our other audio services we're furthermore passionate to breaking fresh ground for interactive soundtrack design," said Seliger.

"Besides our music middleware psai being ready for action, we have brought in three very talented composers whose previous clients have included NASA/ESA, Audi, Red Bull and Sony, and we believe that their experience from outside the video games industry as well as their curiosity for the new technology will build on our growing reputation."

www.periscopestudio.de

Australian outfit **Trickstar Games** has licenced Fork Particle for its upcoming unannounced project.

The studio said it was using Fork Particle for enhanced visual effects in an 'upcoming flying game title in development for a major US publisher'.

"Fork Particle provides the right tools we need to create impressive particle effects for our game," said Trickstar technical director Thomas Mayer. "The Fork run time technology is cross platform and flexible."

"We are able to make game specific customisations with ease. Our project requires spectacular graphics quality and Fork's particle effects solution delivers the kind of graphics realism we are looking for."

www.trickstargames.com

Phil Harrison and Robin Kaminsky have joined the advisory board of cloud-based game streaming service **Gaikai**.

According to the company, the involvement of the pair will help 'disrupt the way games are discovered and enjoyed' by consumers.

Harrison, general partner at London Venture Partners and former president of SCE Worldwide Studios is one of the most high-profile industry figures now involved in Gaikai. His involvement will be seen by many as a significant boon to Gaikai's fortunes, and that of cloud gaming in general, as Harrison was so pivitol in the creation of the PlayStation brand.

Meanwhile Kaminsky brings more than 20 years of experience building consumer and technology companies.

www.gaikai.com

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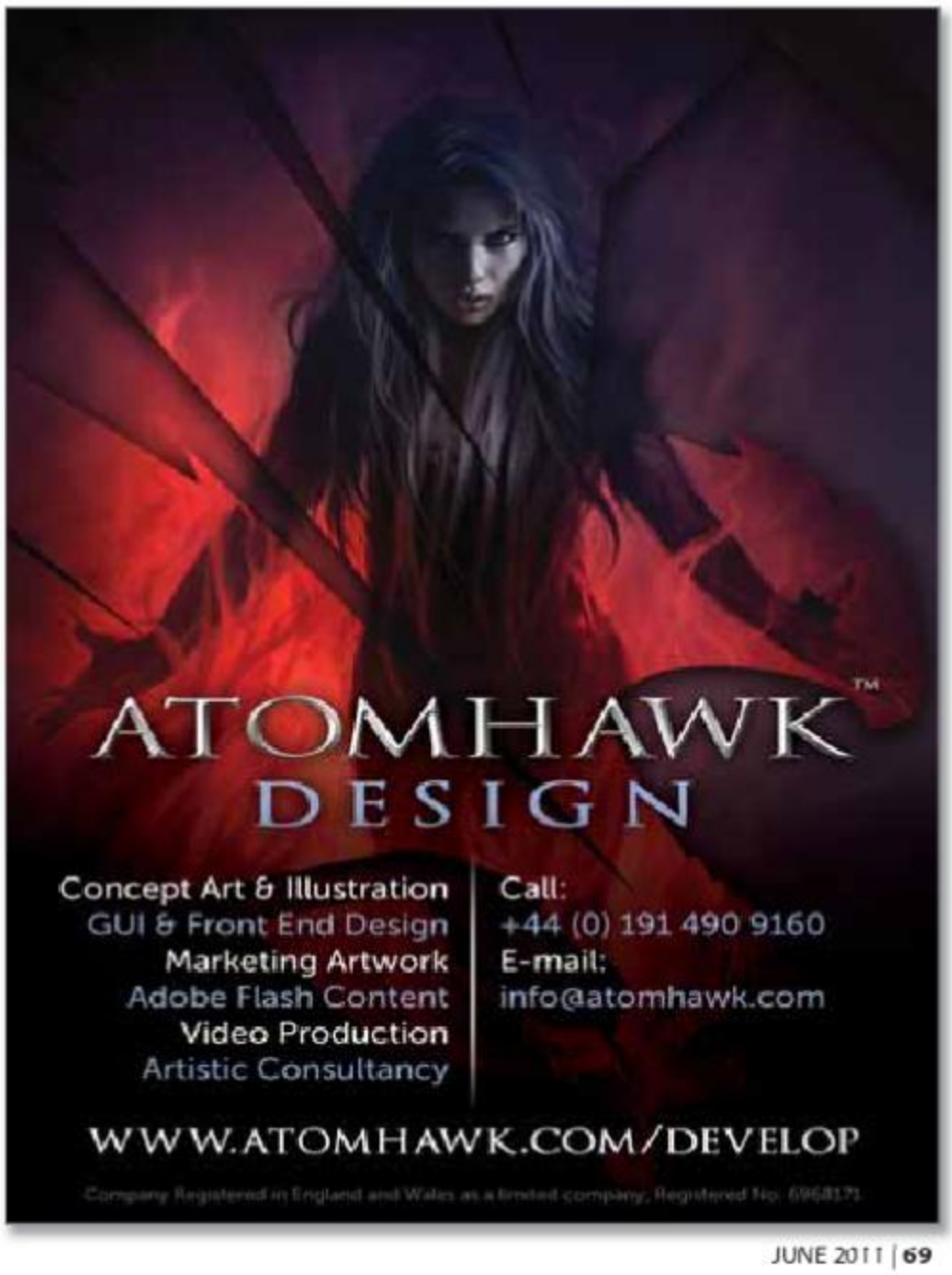

SERVICES SPOTLIGHT

This month: OC3

The OC3 Entertainment **FaceFX** facial animation kit is a technology solution that allows developers to create facial animation directly off of the voice acting audio files for any given development project. A combination of lip-sync, graphics and facial animation tech, the kit allows for a full application across a game's audio, or insertion in specific areas with developer tweaking and finalisation possible throughout.

OC3 has reported use of the technology in the development of over 150 global, triple-A titles, with full source code for FaceFX Studio Unlimited letting developers integrate the solution into pipelines with full batch processing capabilities.

The central element of the FaceFX system is the face graph, which combines bone poses and morph targets into a single target, which is driven by animation curves. These are generally created by a speech recognition system, but can also be manually edited. The resulting facial animation is then outputted to the game engine as either bone transformation or morph target in individual frames.

Its combined system creates a solution that many studios have taken advantage of, and that apparently pushes OC3 to the pinnacle of the current affordable facial animation mountain.

www.facefx.com

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TRAINING NEWS

This month: UKIE, TIGA and the Livingstone-Hope Skills Review

Games industry trade bodies **UKIE** and **Tiga** have formed a special partnership to deliver this year's Edinburgh Interactive Festival.

The event is set to run from August 11th to 12th, and will feature a range of free public screenings of new games and related technologies, as well as a number of sessions on how attendees can become involved in the ever-appealing video games industry.

This year's event will take place at a new venue in the form of the Radisson Blu Hotel.

"Having the combined force of Tiga and UKIE working together can only make this year's Edinburgh Interactive the best ever," suggested Edinburgh Interactive chairman and Nintendo UK general manager David Yarnton.

"This year is a fresh start for Edinburgh Interactive and there will be something for everyone.

"We'll be developing an exciting programme of business events, fun showcases and educational seminars that will highlight the very best of the interactive entertainment industry.

"Having the conference and showcase screenings at the prestigious Radisson Blu Hotel, on the Royal Mile, will ensure that Edinburgh Interactive will be right at the heart of this year's Fringe."

www.edinburghinteractive.co.uk

Hopes remain high for implementation of the **Livingstone-Hope Skills Review**, according to Culture Minister Ed Vaizey.

However, the Conservative minister suggested that little progress has been made to the paper since its introduction in February.

"We've set up a task force, which I'm going to be part of, and we can examine how much progress has been made," he told *Develop*.

The widely-applauded Skills Review made 20 proposals for how academia can adapt to the modern age of technology-lead creative industries. The Skills Review's headline proposal is to incorporate computer science into Britain's national curriculum "as an essential discipline".

Vaizey implied that even this big call still had a chance of being implemented.

"I wouldn't say any of the proposals are off the table," he said.

"Obviously a lot of the proposals require implementation, so for example, the proposal to recruit high quality teachers for computer science requires a lot of planning, so some ideas are long-term and others are quick fixes.

"Whether or not computer science will be part of the national curriculum; well, we're undertaking a curriculum review and we'll see what the outcome is."

www.nesta.org.uk

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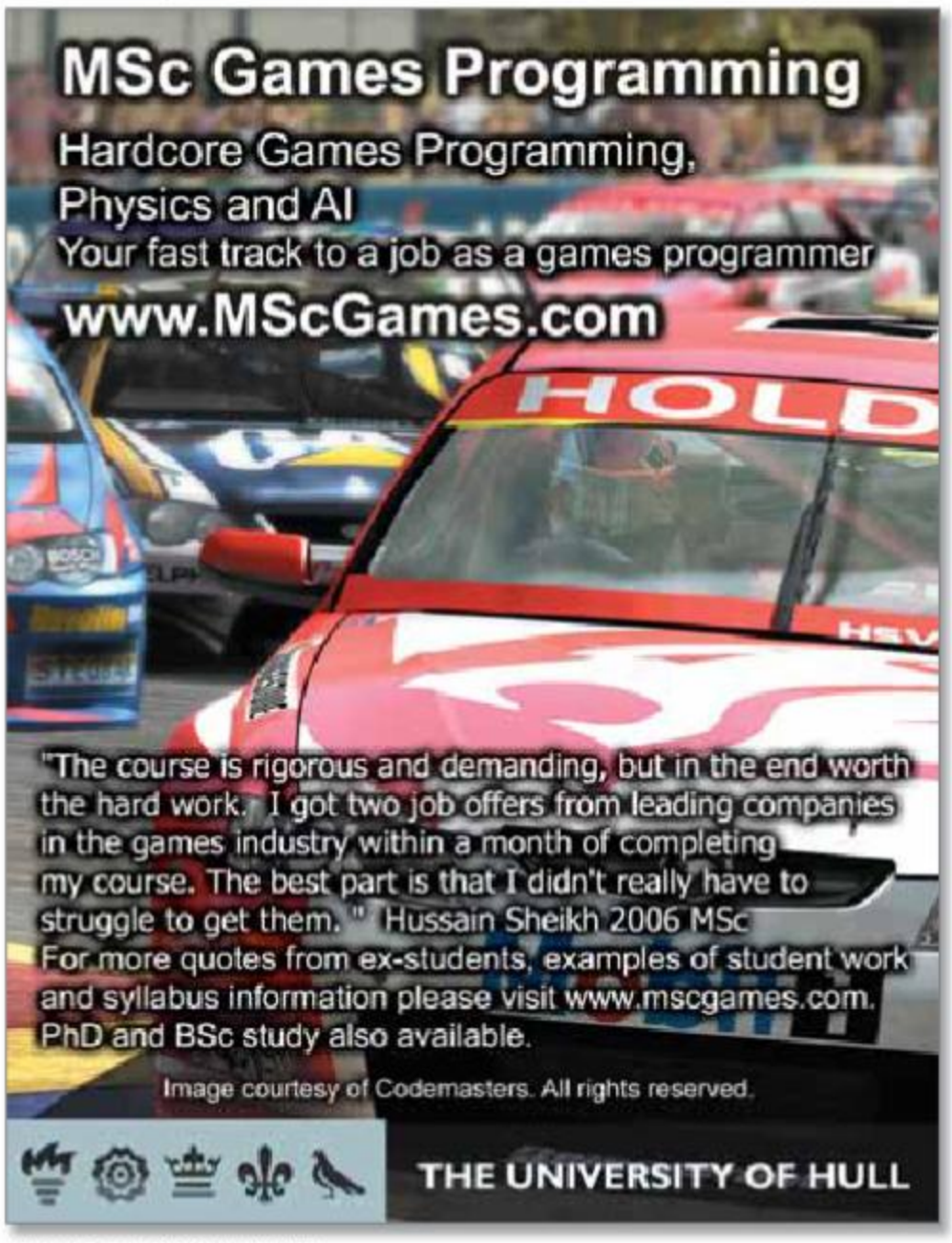
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THE DEVELOP QUIZ

They came, they drank the bar dry, and they were tested – It could only be the return of the Develop Quiz

LAST MONTH teams of developers from all over London flocked to the latest Develop Quiz. In the end, a Jagex team emerged as the winners of the riotous event, which brought together some of the greatest minds in the sector for an evening of intellectual sparring.

The Cambridge studio, which entered two teams, saw its 'Jagex 2' squad emerge as victorious. The team triumphed over second-placed Spilt Milk Studios and third-placed Peppermint PR, after answering eight tough rounds of questions.

Thanks to our generous joint-headline sponsors Qualcomm and Jagex, and round sponsor Avatar Games Recruitment, the night was a huge success, and everybody enjoyed themselves a great deal.

In order of score, starting with the highest, the following teams did battle at the Develop Quiz:

1.	**WINNERS** Jagex 2	**60 points**
2.	Spilt Milk Studios	**58 points**
3.	Peppermint P	**57 points**
4.	Blitz Game Studios	**56 points**
5.	Datascope	**54 points**
6.	Headstrong Games	**53 points**
7.	Creative Assembly	**52 points**
8.	Firefly Studios	**52 points**
9.	Jagex 1	**52 points**
10.	Mind Candy	**50 points**
11.	Centroid	**50 points**
12.	Big Head Games	**49 points**
13.	Qualcomm 2	**44 points**
14.	Harbottle & Lewis	**41 points**
15.	Rocksteady	**40 points**
16.	Wave Studios	**38 points**
17.	Qualcomm 1	**35 points**

1: JAGEX 2 – WINNERS

2: SPILT MILK STUDIOS

5: DATASCOPE

6: HEADSTRONG GAMES

9: JAGEX 1

10: MIND CANDY

13: QUALCOMM 2

14: HARBOTTLE & LEWIS

15: ROCKSTEADY

3: PEPPERMINT P

4: BLITZ GAME STUDIOS

7: CREATIVE ASSEMBLY

8: FIREFLY STUDIOS

11: CENTROID

12: BIG HEAD GAMES

16: WAVE STUDIOS

17: QUALCOMM 1

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FORWARD PLANNER

July 2011

Regional Focus: Guildford
One of the UK games industry's many famed clusters goes under the *Develop* microscope

Events:
Develop Conference – July 19th to July 21st
Develop Awards – July 20th

August 2011

Visual Arts/CG/Game Graphics
New techniques and tech for cutting edge in-game visuals

Regional Focus: Germany
A profile of the German games sector to accompany GDC Europe/Gamescom

Event:
GDC Europe – August 15th to August 17th
Gamescom – August 17th to August 21st

September 2011

Artificial Intelligence
The new tricks and tools developers are using to make characters think

MMOs/Online Technology
A round-up of all the new trends and technologies in connected games

Regional Focus: Northern England East & West
Whats new in key hubs including Liverpool, Leeds, Sheffield and Newcastle

October 2011

Regional Focus: London
A fresh look at games development in the UK's capital city

Events:
GDC Online – October 10th to October 13th
London Games Festival - Dates TBC

November 2011

Region Focus: Canada
From Quebec to Vancouver, this overview profiles all the key Canadian studios

Event:
London Games Conference – November 3rd (details TBC)

December 2011/January 2012

Region Focus: London
The movers and shakers of the UK capital's games development scene profiled

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THE FAQ PAGE: PAULINA BOZEK

Develop grills respected figures from the global development sector…

Bozek, who was pivotal in the creation of the SingStar franchise, is now at the head of social start-up studio Inensu

Who are you and what do you do?
Paulina Bozek, co-founder and CEO of social gaming start-up Inensu. We make games and apps for social networks and smartphones with a focus on bringing games and social mechanics to popular themes like music and fashion. Previously I was the executive producer of the *SingStar* music game franchise for PlayStation.

What are you working on right now?
We formed Inensu last May and have built up a team of technologists and designers and will launch our first two products over the next few months.

One is a social fashion app that is all about swapping clothes with your friends. It's for teens and carries a sustainability message that champions personal style over disposable high street fashion. It is being developed in collaboration with Channel 4 Education and will be on Facebook, iPhone and Android.

We are also working on a music fan platform that is all about connecting fans to music stars in a social game environment. More on this very soon.

What was the first video game or product that you ever worked on in the industry?
My first 'professional project' was at *Paper Magazine*, an arts, fashion, culture magazine based in New York City. I was an intern and did a weekly online fashion feature called Cornered Style, which consisted of finding cool-looking people on the street and interviewing them. My first job out of university was with Ubisoft; I joined as a PR assistant and later became the project manager of *Kasparov Chess* – an online multiplayer chess site that was part of the Ubisoft online games portal.

> ***My first job out of university was with Ubisoft; I joined as a PR assistant and later became the project manager of Kasparov Chess.***
>
> Paulina Bozek, Inensu

I worked with Kasparov's team in Israel and NYC and I was based in Montreal. I was pretty young and didn't really know what I was doing so all the learning was on the job and had to be fast. It was stressful but I learned a huge amount and the team was very talented.

What was the first video game you ever played, and did you enjoy it?
I played a lot of *Super Mario Brothers* with my brother. But as a little girl, I was more into *Nancy Drew* novels than games and putting on talent shows with my friends.

What is your favourite game ever, and for what reason?
Would it be cheating to say it's *SingStar*? This is my favourite game ever because it's all about friends and music. Otherwise I'm playing *Nintendogs* on the 3DS, *Words With Friends* on my iPhone and various new Facebook games.

What do you enjoy about the video games industry today?
The fact that it constantly reinvents itself – there is no definition of what a game is, and this is true now more than ever.

What disappoints you about the video games industry today?
This is a bit detailed and not exclusive to games, but if I had it my way, I would make legal departments and regulatory organisations more entrepreneurial and take calculated risks to come up with innovations and solutions.

Technology and user behaviour moves fast and sometimes existing frameworks don't make sense.

Content industries like music have felt massive disruption from technology and I think we'd be better off to act fast and find new ideas for monetisation rather than focusing on policing users.

What hobbies, collections or interests do you have that are completely unrelated to video games?
I have become a runner. There was a time when I couldn't run for more than 10 minutes. Now I run 50 kilometres over four days.

As for collections, when it comes to music I hate having physical things like CDs, and even downloading MP3s is inconvenient, I prefer streaming everything.

However, when it comes to books, I could never get rid of my books and go digital only. My bookcase is my favourite thing in the entire house.

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